AIR TRAFFIC
BY THE NUMBERS

August 2020

Federal Aviation Administration

FAA Contributors to ATO By the Numbers

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        - **AJR-G Performance Analysis**
        - **AJR-B Flight Service**
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    - **ABP-230 – Data Analysis and Reporting Services Branch**
    - **APO – Aviation Policy & Plans**
    - **AST – Office of Commercial Space Transportation**
    - **AVS – Aviation Safety**

Data Sources

Database Name	Owned/Managed by
Aviation System Performance Metrics (ASPM)	AJR-G
Operations Systems Network (OPSNET)	AJR-G (archive), AJM and AJW
National Traffic Management Log (NTML)	AJR-G (archive), AJM and AJW
Traffic Flight Management System (TFMS)	AJR-G (archive), AJM and AJW
National Offload Program (NOP)	AJR-G (archive) and AIT
U.S. Civil Airmen Statistics	APO
Runway Incursion Data	AVS
BTS T-100 Market and Segment Data	Bureau of Transportation Statistics

Table of Contents

Introduction

Air Traffic By the Numbers, or the *ATO Fact Book*, is a source book that contains U.S. airport and air traffic control operations and performance annual data from the Federal Aviation Administration (FAA). It also includes information on passengers, runway incursions, commercial space launch activity, the economic impact of aviation, and the like.

The *Fact Book*, produced by the Office of Performance Analysis, Air Traffic Organization (ATO) of the FAA, is updated annually, with data now current to FY2019. This particular document represents the fourth edition of *Air Traffic By the Numbers*; three previous editions appeared in August 2017, November 2018, and June 2019. Be aware, the FY2019 results do not include the impact of the COVID-19 pandemic, as the pandemic began during FY2020.

Organization of the *Fact Book* is unchanged from last year. Section 1 includes some overall Air Traffic Management statistics. NAS Demand and Efficiency measures appear in Section 2. New Delay, Diversion, Go-Around, and Cancellation information follow in Section 3. In Section 4 includes the latest data on the impact of various Traffic Management Initiatives (TMI). Updated FY2019 Safety Metric results are reported in Section 5. Other ATO Topics of interest are available in Section 6.

Some air traffic-related results for FY2019 show:

- The number of air traffic controllers decreased by 2.2 percent, to 14,375 (in Section 1).
- The number of pilot certificates increased by 4.9 percent in CY2019, to 664,563; and remote (or drone) pilot certificates increased by 50.8 percent, to 160,302 (Section 1).
- The number of passengers flown by air carriers increased by 3.8 percent, to 1.1 billion (Section 1).
- IFR flights in the U.S. rose by 1.7 percent, to 16.4 million (Section 1).
- At any giving minute during peak operational times, almost 5,400 flights were en route in U.S. airspace (Section 2).
- Core 30 airport operations rose by 1.8 percent, to 13.2 million; operations handled by stand-alone TRACONS rose by 1.9 percent, while operations handled by centers fell by 2.5 percent (Section 2).

Further, at Core 30 airports, we find:

- Flight delays rose by 15 percent, to 299,244 (Section 3).
- Flight diversions rose by 7 percent, to 19,269 (Section 3).
- Cancellations increased by 4.9 percent to 106,248 (Section 3).
- Runway incursions fell by 1 percent, to 392 (Section 5).

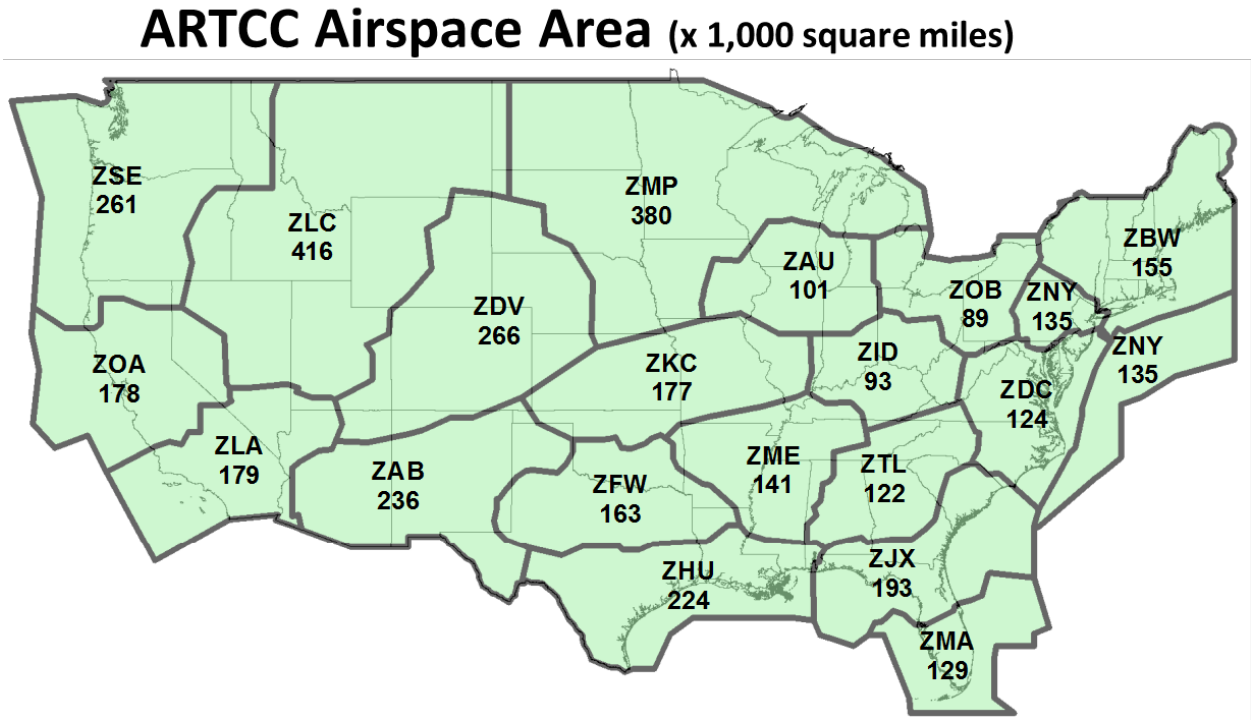
Work on this publication benefited from the contributions from many offices and individuals throughout the Air Traffic Organization and the Federal Aviation Administration. We thank everyone who participated in this effort.

System Events and Analysis Group (AJR-G3)
Office of Performance Analysis
System Operations Services
Air Traffic Organization
Federal Aviation Administration
U.S. Department of Transportation

August 2020

Air Traffic Organization Leadership

www.faa.gov/about/office_org/headquarters_offices/ato/leadership



Section 1. Air Traffic Management System Overview for FY2019

ATO Program and Financing Operations Budget Estimate (in $billions) (FY2019)	**$7.8**
Flights Handled	
Scheduled	10,390,000
Unscheduled	6,015,000
Total	**16,405,000**
Airspace (in millions of sq mi)	
Oceanic	24.1
Domestic	5.3
Total	**29.4**
Airports	
Public Airports	5,082
Private Airports	14,551
Total	**19,633**
ATC Towers	
Federal	264
Contract	256
Total	**520**
TRACONs	
Stand-Alone	25
Combined ATC Towers	122
Total	**147**
En Route Centers & CCFs	
ARTCC	21
CCF	4
Total	**25**
NAVAIDS	**13,095**
Alaska Weather Cameras	**236**
Controllers	**14,375**
GA Aircraft (CY2018)	
Fixed Wing	167,600
Rotorcraft	10,000
Experimental/Lightcraft/Other	34,200
Total	**211,800**
GA Flight Hours (CY2018)	**25,506,000**

Sources:

ATO Program and Financing: U.S. Dept. of Transportation, Budget Estimates: FY2020, Federal Aviation Administration, p. 2.

Flights Handled: FAA, Office of Performance Analysis (AJR-G), December 11, 2019; Innovata, Flight Schedule Database, accessed June 15, 2020.

Airspace: FAA, Office of Performance Analysis (AJR-G).

Airports and **NAVAIDS**: FAA, Airport Safety, Airport Data and Contact Information, November 8, 2019. https://www.faa.gov/airports/airport_safety/airportdata_5010/; FAA, Technical Operations (AJW), Facility Service and Equipment Profile, October 1, 2019. https://employees.faa.gov/org/linebusiness/ato/operations/technical_operations/ajw1/ajw1B/fsep/

ATC Towers and **En Route Centers & CCFs**: FAA, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), Facility Information, November 2019; FAA, 2019 Air Traffic Controller Workforce Plan, p. 13. https://www.faa.gov/air_traffic/publications/controller_staffing/media/CWP_2019.pdf.

TRACONs: FAA, Air Traffic Services (AJT), Terminal Radar Approach Control Facilities (TRACON). https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/tracon/; Air Traffic Services (AJT), FY2018: Email communication, December 14, 2018; FY2019: FAA consolidations of 7 combined TRACONs.

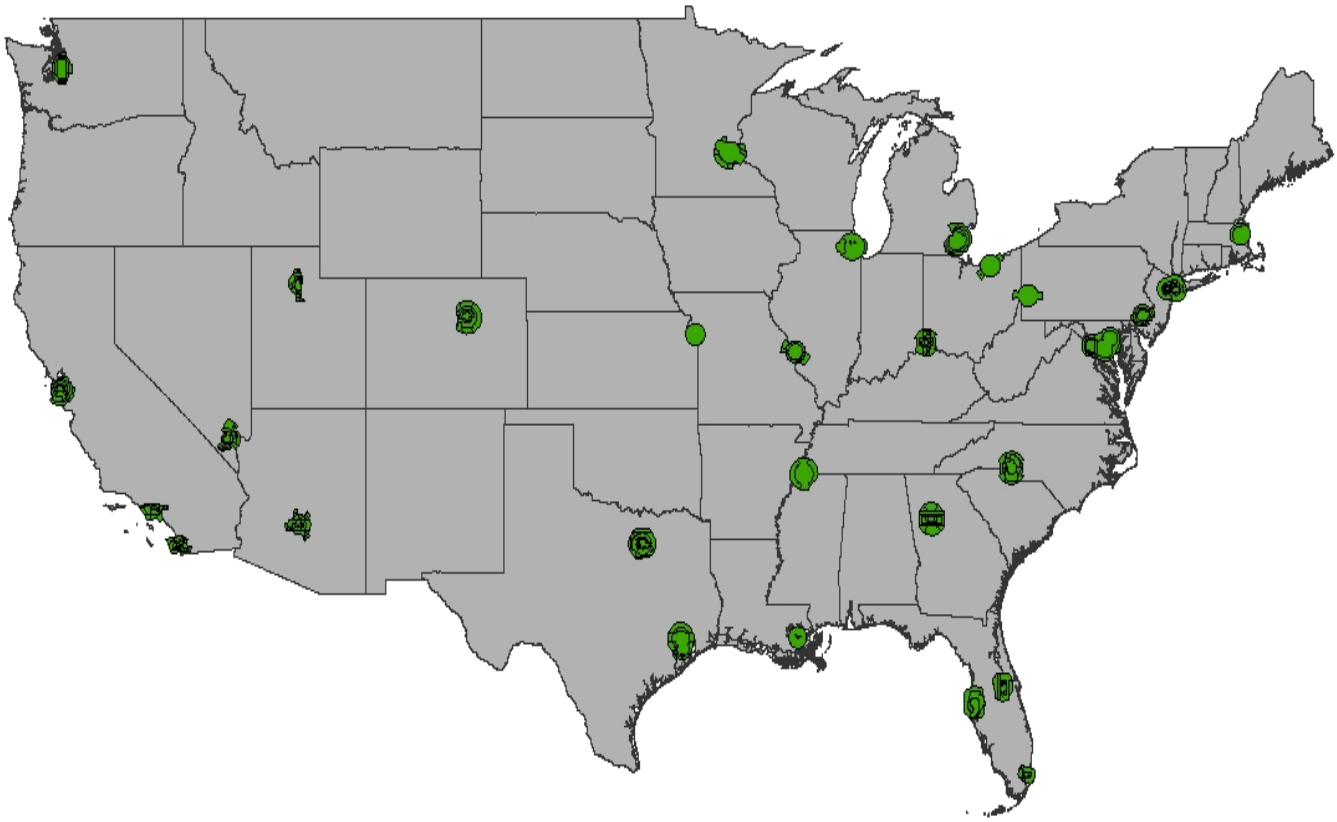
Alaska Weather Cameras: FAA, Air Traffic Organization, Aviation Weather & Aeronautical Services (AJM-33), FAA Aviation Weather Cameras, accessed January 8, 2020. https://avcams.faa.gov/sitelist.php

Controllers: FAA, Office of Finance and Management, Data Analysis and Reporting Services Branch (ABP-230), Air Traffic Controller and Academy Movement Report - September FY2019, October 15, 2019.

GA Aircraft and **GA Flight Hours**: FAA, Aviation Safety (AVS), General Aviation and Part 135 Activity Surveys – CY2018, Tables 1.1 and 1.3, January 8, 2020. https://www.faa.gov/data_research/aviation_data_statistics/general_aviation/

Class B Airspaces (Airspace around Busiest US Airports)

Note: Airspaces accurately represented for coverage area

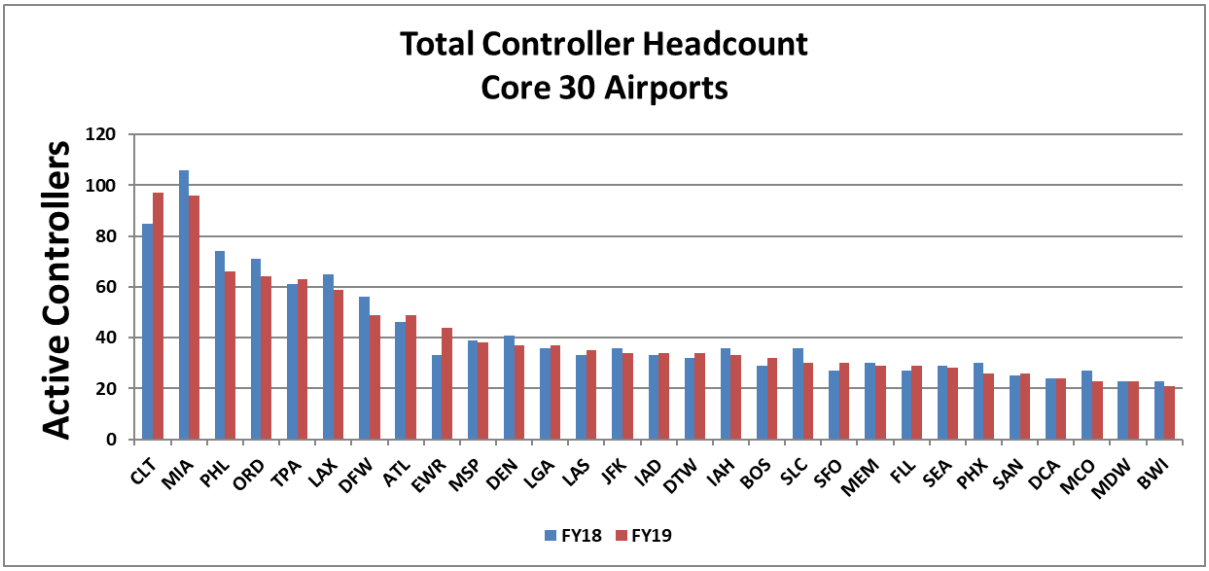


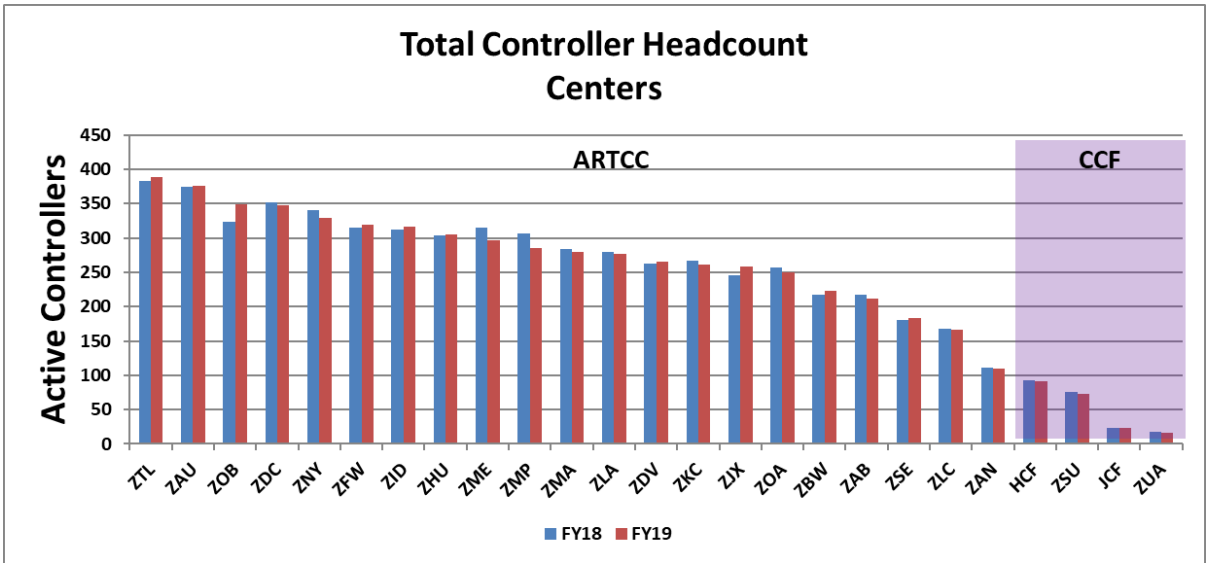
Air Traffic Controllers

As of the end of FY2019, the FAA air traffic controller total was 14,375, a decrease from 14,695 at the end of FY2018.

	FY2018	FY2019
Academy Graduate (AG)	980	882
Developmental (D1)	220	223
Developmental (D2)	700	691
Developmental (D3)	582	564
Certified Professional (CPC)	10,483	10,419
Certified Professional in training (CPCIT)	1,320	1,414
Controllers	**14,285**	**14,193**
Academy	**410**	**182**
Total Headcount	**14,695**	**14,375**

At Core 30 airports, Charlotte (CLT), Miami (MIA), and Philadelphia (PHL) report large headcounts because these are combined ATCT TRACONs. CLT had the highest net gain of controllers at twelve, while MIA had the highest net loss at ten. (*See*, the Appendix for explanations of the Core 30 airport codes.)





Source: Federal Aviation Administration, Office of Finance and Management, Data Analysis and Reporting Services Branch (ABP-230), Air Traffic Controller and Academy Movement Report - September FY2019, October 15, 2019.

Pilot Certificates

The table below shows the number of pilot certificates held by age group (upper panel below) and by year (lower panel). The upper panel illustrates that student, commercial, and remote (or drone) pilots tend to be younger, while airline transport pilots tend to be older. The lower panel informs us that the number of total active pilot certificates held in the U.S. increased by 4.9 percent, from 633,316 in 2018 to 664,563 in CY2019, mainly due to an increase in student pilot certificates from 167,804 to 197,665. Further, the number of remote pilot certifications (which began in August 2016) increased by 50.8 percent, from 106,321 in 2018 to 160,302 in 2019. (Note, the pilot total does not include flight instructors and remote pilots.)

Estimated Active Pilot Certificates Held by Category and Age Group of Holder, as of December 31, 2019

By Age Group	Type of Pilot Certificates							Certified Flight Instructor 2/	Remote Pilot 2/
	Total	Student	Sport	Recre-ational	Private 1/	Commercial 1/	Airline Transport 1/		
Total	**664,563**	**197,665**	**6,467**	**130**	**173,080**	**116,572**	**170,649**	**113,445**	**160,302**
14-15	465	465	0	0	0	0	0	0	0
16-19	21,229	16,159	10	0	4,736	324	0	98	2,150
20-24	70,041	38,573	91	9	17,201	12,798	1,369	5,621	10,995
25-29	78,366	40,945	173	9	13,738	17,408	6,093	9,249	20,014
30-34	66,742	29,728	249	14	12,832	12,398	11,521	11,802	22,769
35-39	61,715	20,863	300	6	12,783	10,102	17,661	13,712	22,053
40-44	52,044	13,850	315	8	11,872	7,604	18,395	11,696	18,180
45-49	49,602	9,539	389	4	11,534	7,094	21,042	11,424	16,760
50-54	54,642	8,340	565	9	13,808	7,502	24,418	11,124	14,326
55-59	60,477	7,483	860	11	17,630	8,583	25,910	10,371	12,606
60-64	55,915	5,230	1,066	21	19,499	8,807	21,292	8,971	9,767
65-69	40,269	3,318	1,004	22	16,848	8,212	10,865	7,599	6,179
70-74	28,125	1,972	741	10	11,335	7,471	6,596	6,297	3,118
75-79	15,628	854	455	5	6,090	4,824	3,400	3,418	1,051
80 & over	9,303	346	249	2	3,174	3,445	2,087	2,063	334

By Year									
2015	**590,038**	122,729	5,482	191	186,786	116,291	158,559	102,628	N/Ap
2016	**584,361**	128,501	5,889	178	174,517	112,056	163,220	104,382	20,362
2017	**609,306**	149,121	6,097	157	174,516	114,186	165,228	106,692	69,166
2018	**633,316**	167,804	6,246	147	175,771	115,776	167,572	108,564	106,321
2019	**664,563**	197,665	6,467	130	173,080	116,572	170,649	113,445	160,302

1/ Includes pilots with an airplane and/or a helicopter and/or a glider and/or a gyroplane certificate. Pilots with multiple ratings are reported under highest rating. For example a pilot with a private helicopter and commercial airplane certificates are reported in the commercial category.

2/ Not included in total active pilots.

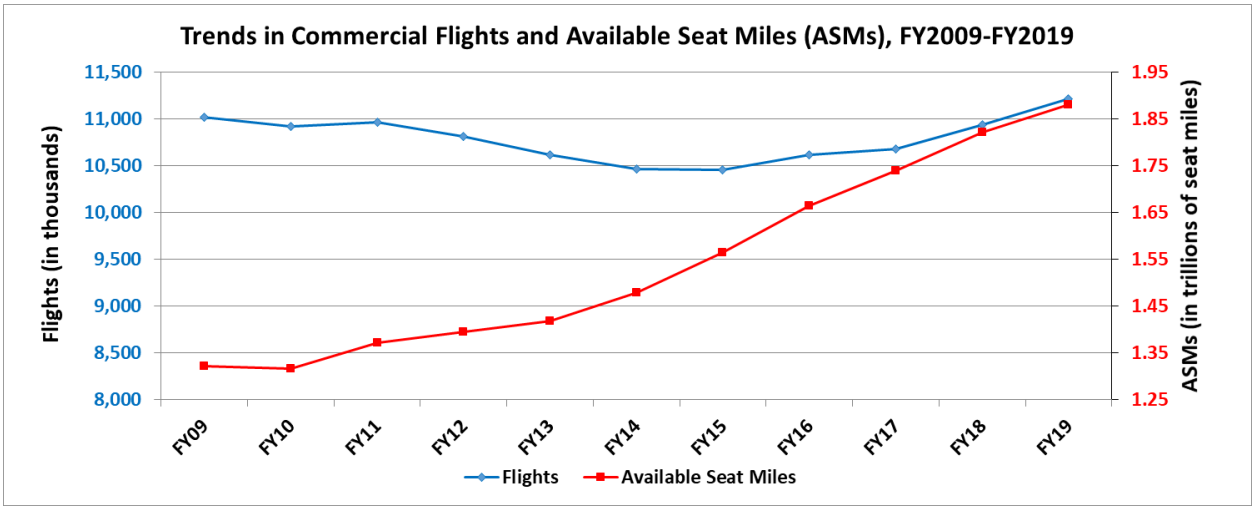
N/Ap Not applicable.

Source: Federal Aviation Administration, Office of Aviation Policy and Plans (APO), U.S. Civil Airmen Statistics, 2019, Table 12, April 22, 2020. https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/

Commercial Flight and Available Seat Mile (ASM) Trends

Since FY2009, there has been a small increase in scheduled commercial flights, but a larger increase in available seat miles (ASMs). ASMs are a measure of passenger capacity by air carriers. It is computed by multiplying the number of seats on an aircraft by the stage length of the flight.

In recent years, airlines have reduced the number of smaller aircraft and increased operations of larger aircraft. Also, the average stage length has increased. Both these factors increase total passenger capacity. Over FY2009-FY2019, data from the Bureau of Transportation Statistics show the number of commercial flights rose by 1.7 percent to 11.2 million in FY2019. The number of passengers rose by 33.2 percent to 1,057.3 million, reflecting impacts of rising load factors and aircraft size. During the same period, RPMs and ASMs rose by 50.8 and 42.3 percent, respectively, indicating rising stage lengths and load factors. The table below shows passenger statistics for the two most recent fiscal years.



Source: U.S. Dept. of Transportation, Bureau of Transportation Statistics, T100 Segment Data, July 24, 2020.

Passenger Statistics		
	FY2018	**FY2019**
Yearly Passengers	1,018,816,332	1,057,346,188
Average Daily Passengers	2,791,278	2,896,839
Revenue Passenger Miles (trillions)	1.51	1.57
Available Seat Miles (trillions)	1.82	1.88
Passenger Load Factor (%)	82.71%	83.36%

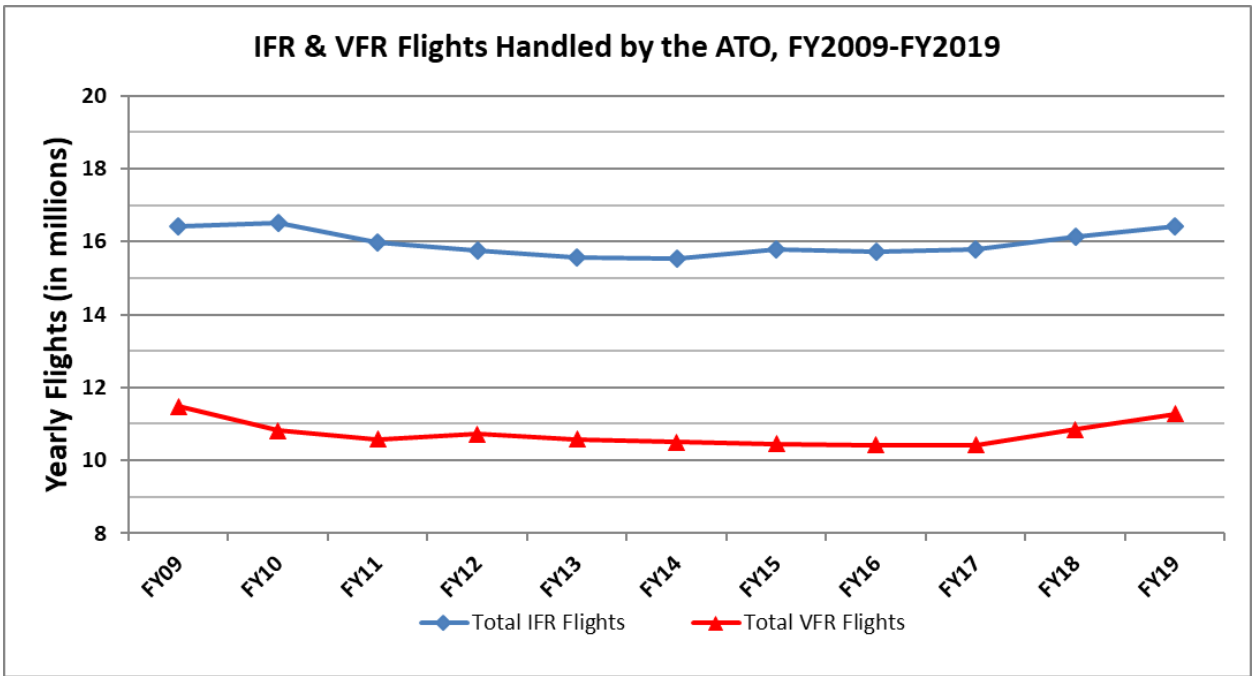
Economic Impact of Civil Aviation		
	CY2015*	**CY2016***
Aviation in US generates # jobs	10,710,000	10,857,000
Earnings of (billions)	$481.90	$488.20
Aviation contributes annually (trillions)	$1.75	$1.77
Constitutes % of GDP	5.3%	5.2%

*Estimates for more recent years are not yet available.

Sources: U.S. Dept. of Transportation, Bureau of Transportation Statistics, T100 Segment Data, July 24, 2020; Federal Aviation Administration, Office of Aviation Policy and Plans, Forecast and Performance Analysis Division (APO-100), Economic Impact of Civil Aviation on the U.S. Economy, January 2020. https://www.faa.gov/about/plans_reports/media/2020_jan_economic_ impact_ report.pdf

Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) Flights across the NAS*

Office of Performance Analysis (AJR-G) data show the number of IFR flights rose by 1.7 percent to 16.4 million, and the number of VFR flights rose by 4.0 percent in FY2019. As the accompanying graph attests, the numbers of IFR and VFR flights fell following the end of the recession and have since been recovering.



*Note: OPSNET reports VFR activity as total operations (arrivals + departures). Total VFR flights are approximated by dividing total operations by 2.

Annual total numbers of IFR and VFR flights also appear in the table below.

Year	IFR Flights	VFR Flights
FY05	18,645,898	13,795,861
FY06	18,066,360	13,378,426
FY07	17,970,314	13,448,515
FY08	17,908,487	12,812,585
FY09	16,428,893	11,480,136
FY10	16,522,406	10,815,975
FY11	15,992,536	10,581,301
FY12	15,760,241	10,714,777
FY13	15,576,396	10,574,201
FY14	15,546,452	10,506,576
FY15	15,782,675	10,455,324
FY16	15,724,478	10,416,280
FY17	15,800,679	10,415,828
FY18	16,122,488	10,843,622
FY19	16,404,606	11,277,851

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), December 11, 2019.

Section 2. Demand and Efficiency in the NAS

The NAS is composed of 520 airport towers, 147 terminal radar control (TRACON) facilities (25 stand-alone and 122 combined ATCT), and 25 control centers (21 air route traffic control centers (ARTCC) and 4 combined control facilities (CCF)).

TRACONs handle descending flights received from a center or ascending flights received from an ATC tower (see figure below). Of the 147 TRACONs in the NAS, 122 of them are combined such that the TRACON exists in the same location as the ATC tower. Such facilities include the Miami, Charlotte, and El Paso towers.

Centers handle all en route flights operating on Instrument Flight Rule (IFR) flight plans. Centers receive flights from or hand off flights to other centers throughout the flight's en route phase of operation. They also receive flights or hand off flights to TRACONs when flights enter or exit the en route phase of operation.

This report reveals the demand observed at some of the busiest facilities, represented by the Core 30 airport towers, the 25 stand-alone TRACONs, and all 25 centers (which include 4 CCFs). Efficiency is also reported based on the following metrics:

Number of Flights at Any Given Minute

Average Hourly Capacity

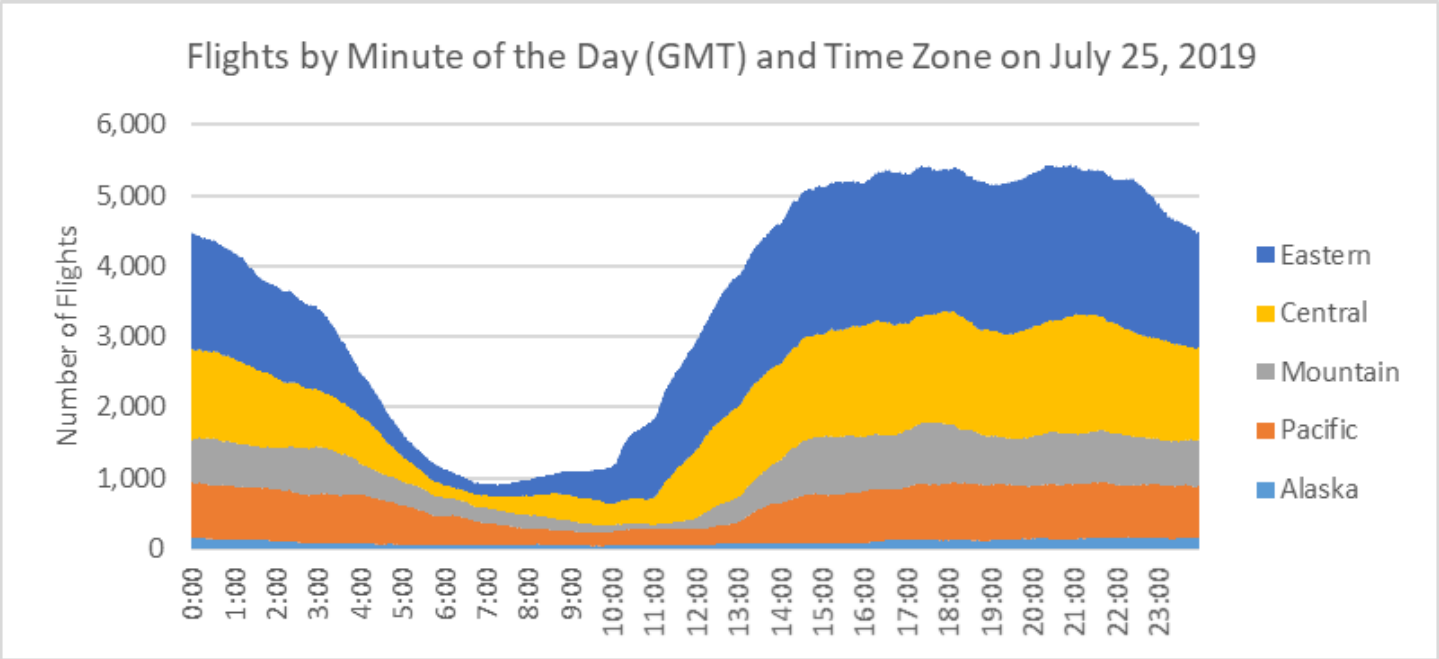
Average Daily Capacity

Number of IFR Flights at Any Given Minute during Peak Operational Times

5,000 Flights

Traffic flow management system (TFMS) flight data were used to determine the number of flights en route every minute of the day and by U.S. time zone on July 25, 2019. Peak operational times in the NAS range between 1500 GMT and 2200 GMT. During peak operational times in the NAS on that day, there were approximately **5,400** flights en route in the NAS every minute.

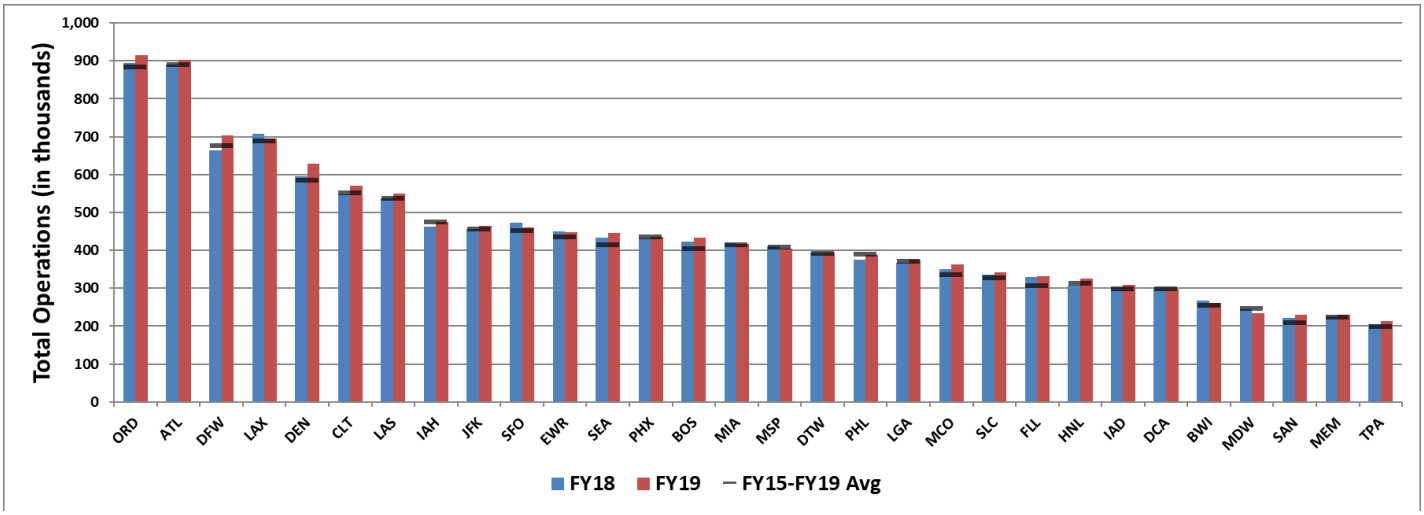
The figure below shows the average number of flights en route per minute and flights under air traffic control within a time zone. The Eastern Time zone has the largest share of flights in the NAS on average and, in this analysis, also includes flights under air traffic control from Puerto Rico and Bermuda. The Pacific Time Zone category includes all west coast air traffic as well as oceanic operations controlled by Oakland center (ZOA), including Hawaii and Guam.



Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), July 10, 2020.

Core 30 Airport Tower Operations

Airport operations are the sum of the number of airport arrivals and departures. Airport traffic controllers handle such operations. Each flight has a departure and arrival, meaning each flight has two airport operations. In FY2019, Core 30 airport operation numbers from OPSNET rose by 1.8 percent, from 13,018,200 to 13,245,722. Below are airport tower operations for each Core 30 airport for FY2018 and FY2019. In FY2019, Chicago O'Hare (ORD), Atlanta (ATL), and Dallas-Fort Worth (DFW) experienced the highest number of operations, each with operations above 700,000. Operations at each of these three airports rose. (*See*, the Appendix for explanations of the Core 30 airport codes.)



Total Core 30 Airport Operations			
FY15-19 Avg	**FY18**	**FY19**	**%Change**
12,877,271	13,013,884	13,245,722	1.8%

Airport	Rank*	FY15-19 Avg	FY18	FY19
ATL	**2**	890,684	889,724	903,135
BOS	**14**	404,659	422,997	432,722
BWI	**26**	255,817	267,692	261,338
CLT	**6**	552,401	547,705	570,751
DCA	**25**	297,930	297,535	297,843
DEN	**5**	584,967	594,522	629,315
DFW	**3**	676,610	663,524	703,157
DTW	**17**	391,194	394,807	394,907
EWR	**11**	436,396	450,711	448,622
FLL	**22**	305,725	329,874	331,201
HNL	**23**	313,149	306,906	324,579
IAD	**24**	298,909	300,947	309,147
IAH	**8**	475,254	462,645	474,155
JFK	**9**	455,408	456,377	465,003
LAS	**7**	536,810	537,411	549,098

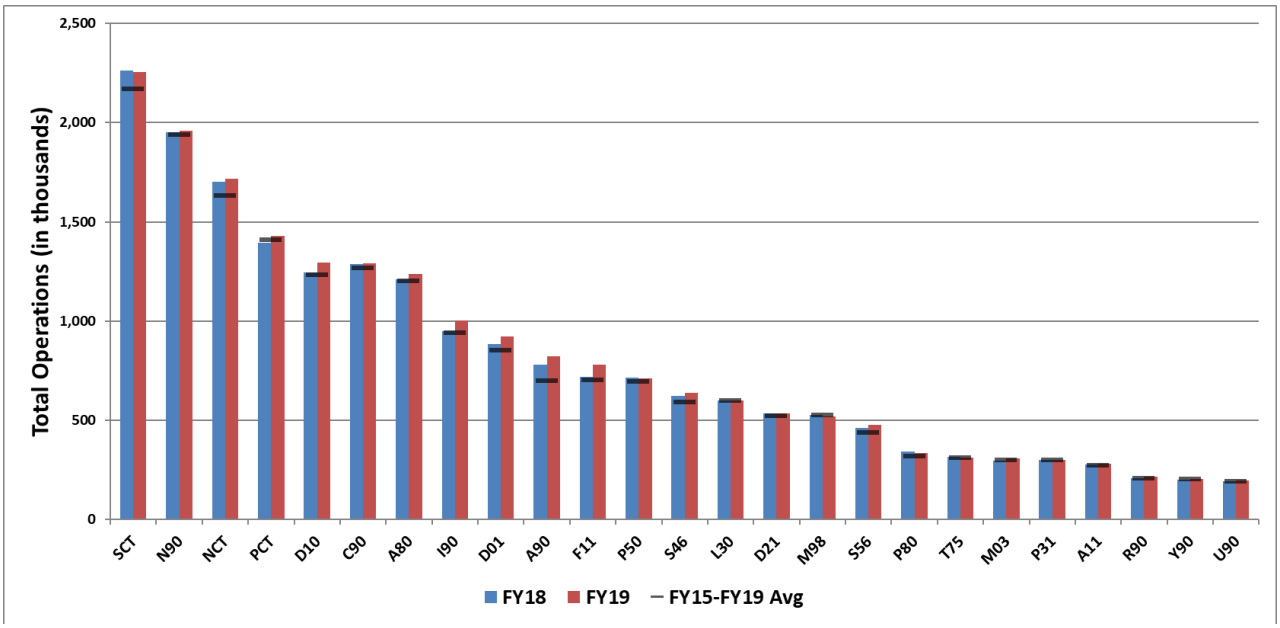
Airport	Rank*	FY15-19 Avg	FY18	FY19
LAX	**4**	687,665	706,513	694,975
LGA	**19**	370,545	367,937	374,397
MCO	**20**	335,928	349,275	363,677
MDW	**27**	247,441	245,178	233,933
MEM	**29**	224,290	225,357	229,664
MIA	**15**	414,106	417,902	417,747
MSP	**16**	409,145	409,982	404,644
ORD	**1**	884,104	893,497	914,615
PHL	**18**	390,112	375,301	388,598
PHX	**13**	435,949	431,397	435,577
SAN	**28**	209,425	221,821	229,985
SEA	**12**	414,573	433,778	445,303
SFO	**10**	452,744	473,148	460,720
SLC	**21**	327,344	335,267	342,738
TPA	**30**	197,984	204,154	214,176

*Ranked by FY19 operations.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 12, 2019.

Stand-Alone Terminal Radar Control (TRACON) Facilities

TRACON operations are the count of IFR and VFR itinerant operations passed to and from area airports or centers, including overflights through TRACON airspace. In FY2019, among the 25 stand-alone TRACONs, operations rose by 1.9 percent, from 20.0 million in FY2018 to 20.3 million in FY2019. Below are operation counts for each of the 25 stand-alone TRACONs for FY2018 and FY2019. In FY2019, Southern California (SCT), New York (N90), and Northern California (NCT) had the highest number of operations, each with operations above 1.7 million. Operations at New York and Northern California grew, while Southern California operations fell. (*See*, the Appendix for explanations of the TRACON facility codes.)



Total Stand-Alone TRACON Operations			
FY15-19 Avg	FY18	FY19	%Change
19,534,893	19,964,693	20,343,525	1.9%

TRACON	Rank*	FY15-19 Avg	FY18	FY19
A11	22	274,753	277,054	281,950
A80	7	1,200,943	1,208,683	1,236,695
A90	10	699,283	780,137	821,995
C90	6	1,267,763	1,285,189	1,291,157
D01	9	854,059	884,283	922,036
D10	5	1,232,469	1,246,057	1,294,512
D21	15	523,725	532,512	535,219
F11	11	703,592	719,056	778,136
I90	8	941,545	948,029	1,003,007
L30	14	599,783	597,930	600,761
M03	20	298,116	297,455	308,588
M98	16	525,140	527,669	520,529
N90	2	1,940,658	1,949,918	1,957,767

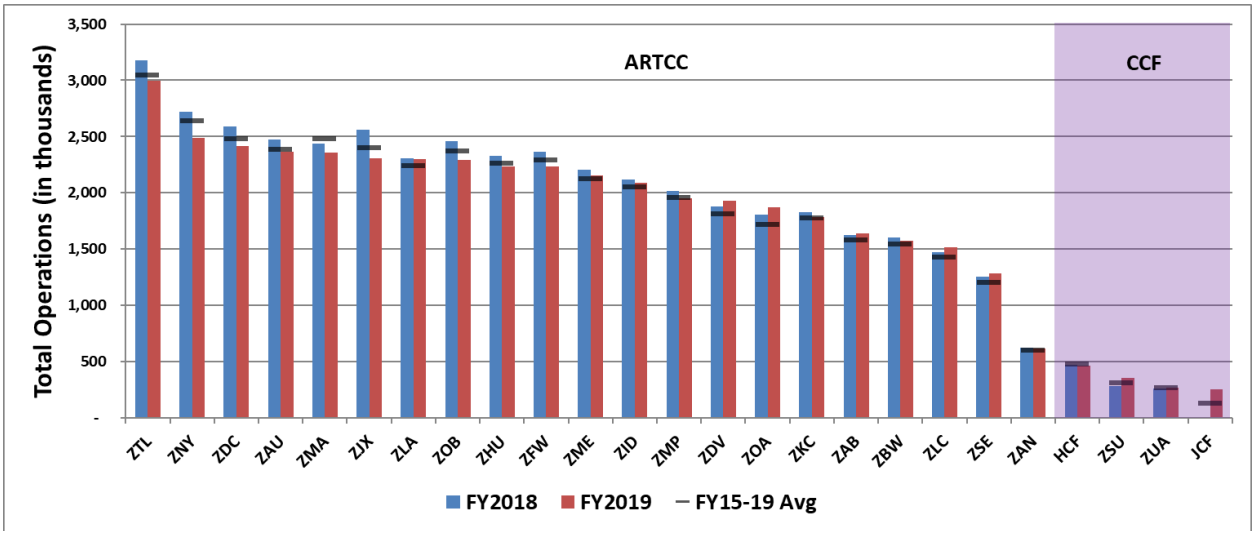
TRACON	Rank*	FY15-19 Avg	FY18	FY19
NCT	3	1,633,697	1,699,904	1,716,512
P31	21	299,070	300,153	301,111
P50	12	694,040	714,858	712,028
P80	18	320,814	340,851	335,485
PCT	4	1,409,337	1,395,390	1,428,613
R90	23	208,161	207,008	215,448
S46	13	592,713	620,734	636,714
S56	17	436,882	461,517	478,433
SCT	1	2,171,072	2,262,881	2,253,178
T75	19	313,153	315,881	312,376
U90	25	191,875	190,962	197,810
Y90	24	202,250	200,582	203,465

*Ranked by FY2019 operations.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 12, 2019.

Air Route Traffic Control Centers (ARTCC) and Combined Control Facilities (CCF)

ARTCC or en route operations are the count of IFR and VFR itinerant operations passing from a TRACON to a center, or from one center to another center, or from a center to a TRACON. It includes U.S. overflights and oceanic traffic through center air space that do not arrive at or depart from U.S. territory. In FY2019, en route operation numbers for the 21 ARTCC and 4 CCFs fell by 2.5 percent, from 44.9 to 43.7 million. Below are operation counts by center for FY2018 and FY2019. In FY2019, Atlanta (ZTL), New York (ZNY), and DC (ZDC) reported the highest number of operations, each with more than 2.5 million. (*See*, the Appendix for explanations of the ARTCC and CCF codes.)



Total ARTCC & CCF Operations			
FY15-19 Avg	**FY18**	**FY19**	**%Change**
43,466,873	44,854,401	43,734,452	-2.5%

Center	Rank*	FY15-19 Avg	FY18	FY19
HCF	**22**	476,220	468,112	463,596
JCF	**25**	130,601	7,264	253,937
ZAB	**17**	1,582,025	1,622,152	1,639,182
ZAN	**21**	599,084	625,245	612,643
ZAU	**4**	2,384,021	2,477,119	2,363,935
ZBW	**18**	1,543,676	1,600,563	1,576,481
ZDC	**3**	2,483,776	2,587,988	2,412,375
ZDV	**14**	1,816,898	1,875,544	1,928,328
ZFW	**10**	2,295,217	2,363,877	2,230,886
ZHU	**9**	2,261,079	2,325,064	2,237,619
ZID	**12**	2,050,678	2,117,531	2,090,931
ZJX	**6**	2,404,592	2,563,215	2,307,573
ZKC	**16**	1,774,016	1,824,270	1,784,734

Center	Rank*	FY15-19 Avg	FY18	FY19
ZLA	**7**	2,239,215	2,308,125	2,299,082
ZLC	**19**	1,429,155	1,469,792	1,515,400
ZMA	**5**	2,479,337	2,436,018	2,356,251
ZME	**11**	2,124,229	2,202,717	2,154,585
ZMP	**13**	1,957,410	2,019,408	1,953,087
ZNY	**2**	2,641,912	2,718,612	2,488,341
ZOA	**15**	1,721,388	1,805,330	1,868,625
ZOB	**8**	2,372,265	2,459,487	2,294,035
ZSE	**20**	1,203,016	1,252,613	1,280,276
ZSU	**23**	313,572	284,402	356,585
ZTL	**1**	3,049,690	3,177,291	2,998,979
ZUA	**24**	264,403	262,662	266,986

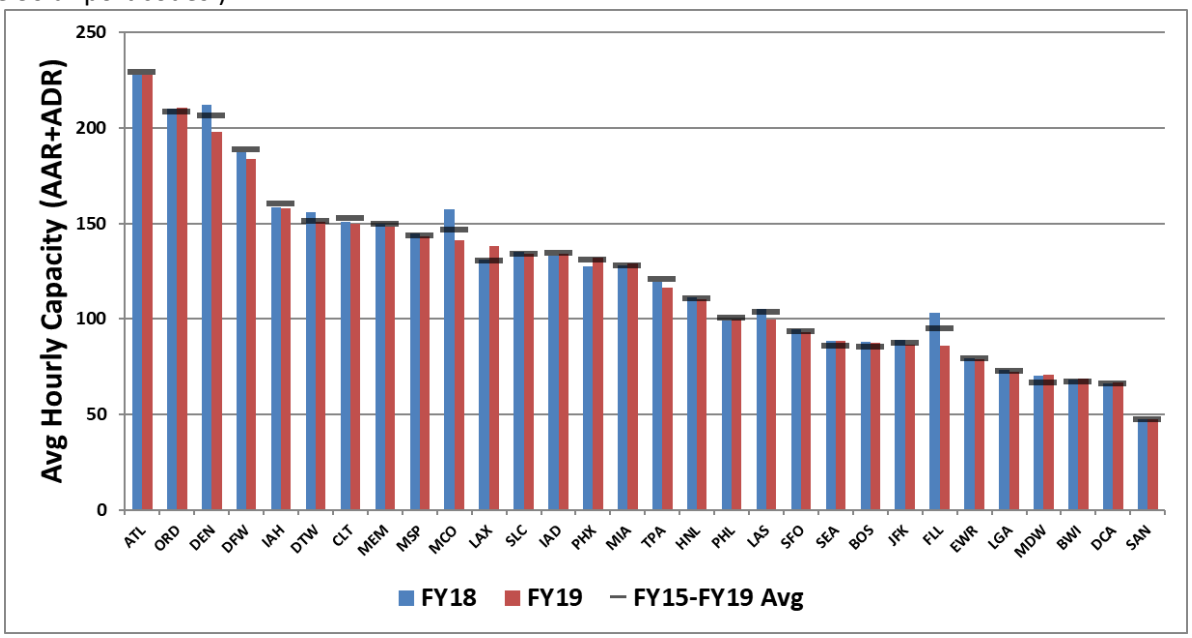
*Ranked by FY2019 operations.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 12, 2019.

Average Hourly Capacity (Called Rate) at Core 30 Airports

In general, airport capacity is determined by its runways and surrounding airspace. For the purpose of this report, capacity is represented by an airport's called rates for reportable hours.

In FY2019, ASPM data for the Core 30 airports show that the highest average hourly called rates were at Atlanta (ATL) and Chicago O'Hare (ORD). Each had an average called rate of over 200 operations per hour. The highest increases occurred at Los Angeles (LAX) (up 5.4 percent) and Phoenix (PHX) (up 3.6 percent). (*See*, the Appendix for explanations of the Core 30 airport codes.)



AHC Across All Core 30 Airports			
FY15-19 Avg	**FY18**	**FY19**	**%Change**
3,681	3,713	3,652	-1.6%

Airport	Rank*	FY15-19 Avg	FY18	FY19
ATL	**1**	230	228	228
BOS	**22**	86	88	87
BWI	**28**	67	68	69
CLT	**7**	153	151	150
DCA	**29**	66	66	67
DEN	**3**	206	212	198
DFW	**4**	189	187	184
DTW	**6**	151	156	151
EWR	**25**	80	79	79
FLL	**24**	95	103	86
HNL	**17**	111	111	110
IAD	**13**	135	133	134
IAH	**5**	160	158	158
JFK	**23**	88	89	87
LAS	**19**	104	105	100

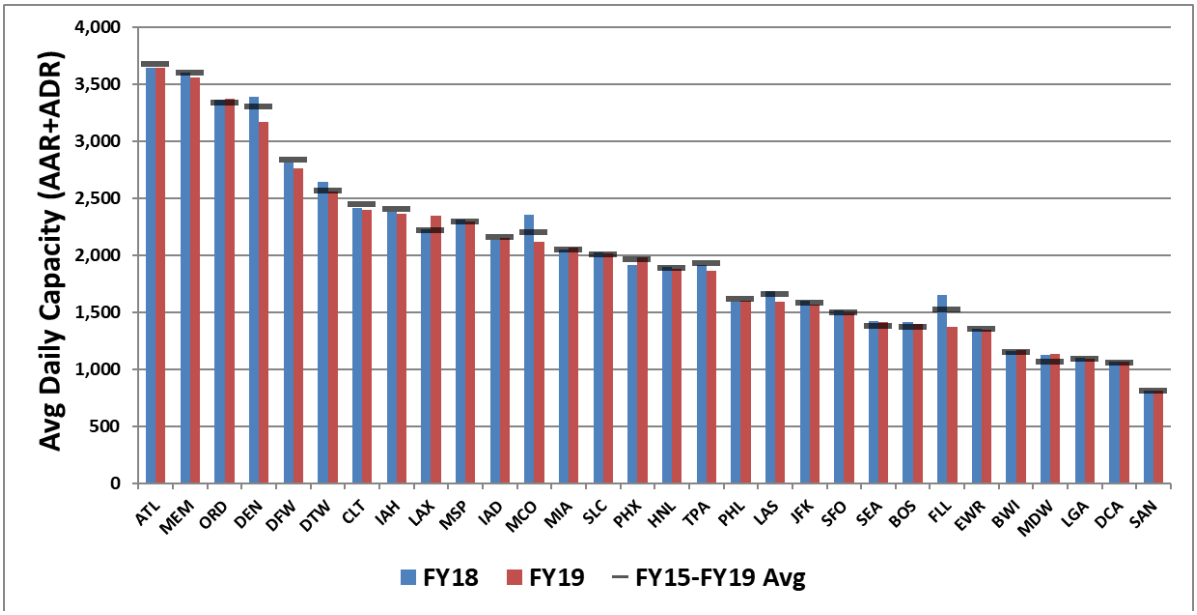
Airport	Rank*	FY15-19 Avg	FY18	FY19
LAX	**11**	130	131	138
LGA	**26**	73	73	73
MCO	**10**	147	157	141
MDW	**27**	67	70	71
MEM	**8**	150	150	148
MIA	**15**	128	128	129
MSP	**9**	143	145	143
ORD	**2**	209	210	211
PHL	**18**	101	99	100
PHX	**14**	131	128	132
SAN	**30**	48	48	48
SEA	**21**	86	89	88
SFO	**20**	94	95	93
SLC	**12**	134	135	134
TPA	**16**	121	120	117

*Ranked by FY2019 call rates.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), December 16, 2019.

Average Daily Capacity (ADC) - Based on Called Rates at Core 30 Airports

In general, airport capacity is determined by its runways and surrounding airspace. For the purposes of this report, capacity is represented by the airport's called rates for reportable hours. Average daily capacity (ADC) is the ATO's official tracking method for determining an airport's capacity during a day. In FY2019, ASPM data for the Core 30 airports show that the highest ADCs are found at Atlanta (ATL), Memphis (MEM), Chicago (ORD) and Denver (DEN); each with an average of over 3,000 operations per day. Note that ADC is larger for Memphis (MEM) than most other airports because all 24 hours are reportable there. (*See*, the Appendix for explanations of the Core 30 airport codes.)



ADC Across All Core 30 Airports			
FY15-19 Avg	**FY18**	**FY19**	**%Change**
60,029	60,537	59,559	-0.1%

Airport	Rank*	FY15-19 Avg	FY18	FY19
ATL	**1**	3,672	3,645	3,642
BOS	**23**	1,370	1,409	1,399
BWI	**26**	1,147	1,159	1,169
CLT	**7**	2,444	2,415	2,394
DCA	**29**	1,060	1,063	1,069
DEN	**4**	3,304	3,389	3,168
DFW	**5**	2,833	2,810	2,759
DTW	**6**	2,570	2,646	2,561
EWR	**25**	1,353	1,351	1,343
FLL	**24**	1,524	1,651	1,372
HNL	**16**	1,884	1,894	1,877
IAD	**11**	2,157	2,132	2,147
IAH	**8**	2,406	2,375	2,365
JFK	**20**	1,580	1,602	1,561
LAS	**19**	1,661	1,682	1,593

Airport	Rank*	FY15-19 Avg	FY18	FY19
LAX	**9**	2,217	2,225	2,345
LGA	**28**	1,090	1,099	1,088
MCO	**12**	2,204	2,357	2,114
MDW	**27**	1,066	1,124	1,132
MEM	**2**	3,597	3,600	3,560
MIA	**13**	2,051	2,052	2,065
MSP	**10**	2,295	2,313	2,295
ORD	**3**	3,338	3,363	3,372
PHL	**18**	1,614	1,587	1,597
PHX	**15**	1,968	1,914	1,983
SAN	**30**	810	811	810
SEA	**22**	1,374	1,417	1,414
SFO	**21**	1,498	1,515	1,487
SLC	**14**	2,008	2,025	2,013
TPA	**17**	1,933	1,912	1,865

*Ranked by FY2019 daily capacity.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), December 16, 2019.

Section 3. NAS Delay, Diversions, Go-Arounds, and Cancellations

Only flights departing from or arriving at their destination at least 15 minutes late are counted as a NAS system delay. The charts that appear below are based on OPSNET numbers, ATO's official source for delay data. Many factors contribute to delay, with weather is the most frequently cited reason. Delay imposes stress on the NAS, air traffic controllers, passengers, and the economy.

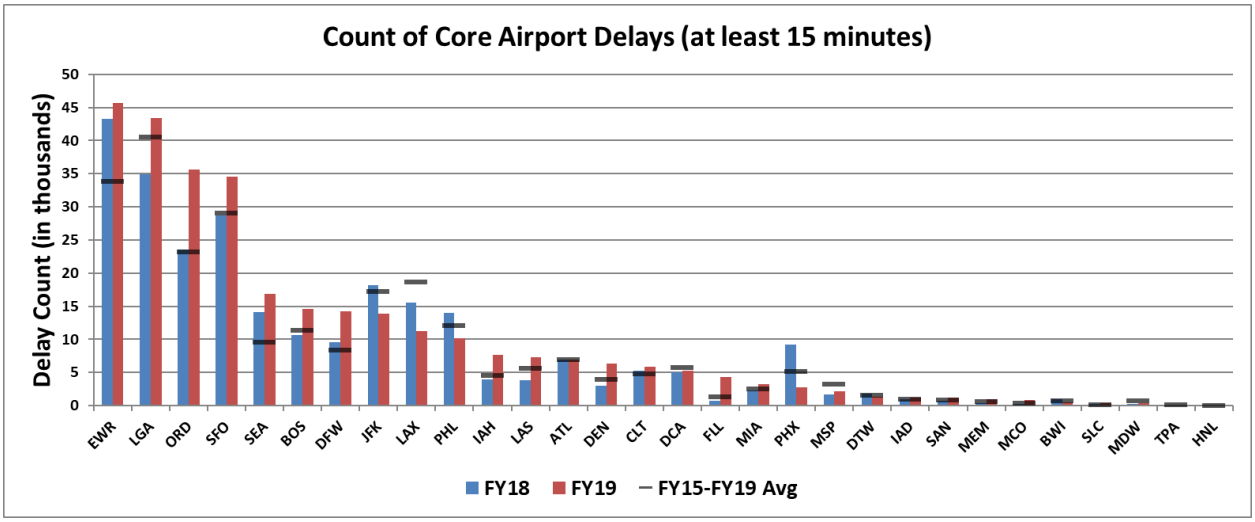
Diversions occur when a flight is routed to a different airport than its original destination. This occurs usually due to convective weather. Other less frequent reasons for diversions are medical emergencies, security, issues with the aircraft, or issues with passengers or crewmembers.

Go-Arounds occur when an aircraft is on approach to the runway but suddenly aborts the landing. This occurs if there is a sudden shift in the wind, an obstruction on the runway, or possibly, the aircraft inadvertently overshooting the runway. Go-arounds result in the aircraft returning to the landing queue to attempt another landing.

Cancellations can occur for numerous reasons either due to weather, extensive delays in the system, equipment issues, etc. Air carriers cancel their own flights in response to these issues. Since the three-hour tarmac rule was imposed after 2010, more flights have been cancelled. This increase in cancellations means reductions in the number of recorded delays.

Counts of NAS Delay at Core 30 Airports

For FY2019, OPSNET data show that the number of Core 30 airport departure delays of at least 15 minutes increased 15 percent. In FY2018 and FY2019, there were 260,325 and 299,244 delays, respectively. According to the graph and table below, in FY2019, delays were highest at Newark (EWR), LaGuardia (LGA), Chicago O'Hare (ORD), and San Francisco (SFO), each with over 30,000 delays. Together these four airports accounted for over one-half of all Core 30 airport delays. (*See*, the Appendix for explanations of the Core 30 airport codes.)



Core 30 Total Delay Counts			
FY15-19 Avg	FY18	FY19	%Change
235,345	260,325	299,244	15.0%

Airport	Rank*	FY15-19 Avg	FY18	FY19
ATL	13	6,967	6,973	6,978
BOS	6	11,395	10,600	14,629
BWI	26	709	933	497
CLT	15	4,766	5,321	5,819
DCA	16	5,795	5,038	5,252
DEN	14	3,986	2,999	6,390
DFW	7	8,409	9,612	14,219
DTW	21	1,622	1,846	1,378
EWR	1	33,787	43,244	45,718
FLL	17	1,331	774	4,366
HNL	30	44	30	15
IAD	22	972	912	1,257
IAH	11	4,564	3,902	7,620
JFK	8	17,271	18,229	13,847
LAS	12	5,668	3,862	7,280

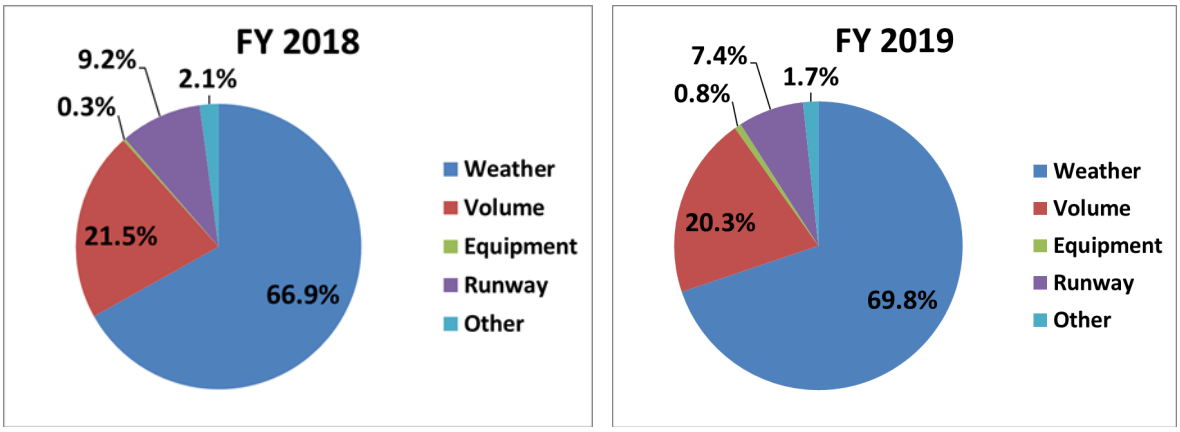
Airport	Rank*	FY15-19 Avg	FY18	FY19
LAX	9	18,637	15,606	11,215
LGA	2	40,558	34,922	43,352
MCO	25	317	224	897
MDW	28	772	271	383
MEM	24	603	376	948
MIA	18	2,566	2,328	3,222
MSP	20	3,226	1,704	2,157
ORD	3	23,176	23,539	35,625
PHL	10	12,103	14,047	10,193
PHX	19	5,197	9,218	2,798
SAN	23	804	747	1,248
SEA	5	9,566	14,072	16,839
SFO	4	29,089	28,652	34,586
SLC	27	188	244	404
TPA	29	84	100	112

*Ranked by number of FY2019 delays.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 17, 2019.

Delays by Category

The two charts below show the sources of delays at Core 30 airports by type of delay.



Note: System impact delays are delays assigned to causal facilities in OPSNET, composed delays due to TMIs, departure delays, and airborne delays. System impact delays are also the basis for delays by class and delays by cause in OPSNET. (http://aspmhelp.faa.gov/index.php/OPSNET_Reports:_Definitions_of_Variables)

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 18, 2019.

Total Cost of Delay

The total cost of flight delays is the sum of costs to airlines, passengers, lost demand, and indirect costs. FAA Office of Aviation Policy and Plans (APO) estimates for 2019 show the cost of delayed flights rose by 9.3 percent, from $30.2 to $33.0 billion, an increase of $2.8 billion. Most of this rise was due to an increase in the impact of delays to passengers, from $16.4 to $18.1 billion, a $1.7 billion difference. Between 2012 and 2019, the total cost of delays rose from $19.2 to $33.0 billion, an increase of $13.8 billion. The cost of delays to passengers accounted for $8.4 billion of this increase.

$Billions	2012	2013	2014	2015	2016	2017	2018	2019
Airlines[1]	5.7	6.0	5.8	5.8	5.6	6.4	7.7	8.3
Passengers[2]	9.7	11.0	10.5	13.3	13.3	14.8	16.4	18.1
Lost Demand[3]	1.3	1.4	1.4	1.8	1.8	2.0	2.2	2.4
Indirect[4]	2.5	2.7	2.6	3.1	3.0	3.4	3.9	4.2
Total	**19.2**	**21.1**	**20.3**	**24.0**	**23.7**	**26.6**	**30.2**	**33.0**

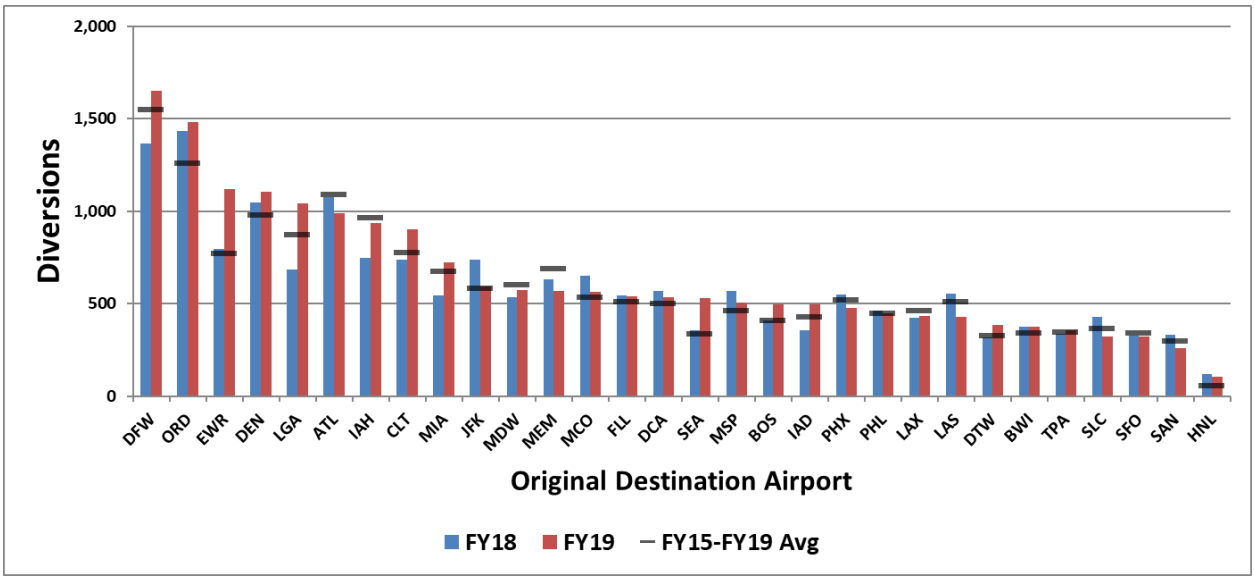
Notes:

1. **Airlines** (cost of delay to airlines): Increased expenses for crew, fuel, maintenance, etc.
2. **Passengers** (cost of delay to passengers): Time lost due to schedule buffer, delayed flights, flight cancellations, and missed connections.
3. **Lost Demand** (cost of passenger decisions to avoid future air travel): Estimated welfare loss incurred by passengers who avoid future air travel as the result of delays.
4. **Indirect** (indirect cost of delay): Other business sectors depend on air travel for transportation. Air travel delays impact these sectors by increasing costs in terms of dollars and time.

Source: Federal Aviation Administration, Office of Aviation Policy and Plans, Forecast and Performance Analysis Division (APO-100), July 8, 2020.

Diversions at Core 30 Airports

The airports reported below are the original intended destinations for the diverted aircraft. Increases in the number of diversions can indicate capacity issues at the airport due to weather, construction, or volume. Over all Core 30 airports, ASPM data show the number of diversions rose by 7 percent in FY2019. Consistent with the graph and table below, there was a 52.7 percent increase in diversions for aircraft destined for LaGuardia (LGA), a 48.7 percent increase at Seattle (SEA), and a 40.8 percent increase at Newark (EWR). (*See*, the Appendix for explanations of the Core 30 airport codes.)



Core 30 Total Diversions			
FY15-19 Avg	FY18	FY19	%Change
18,010	18,010	19,269	7.0%

Airport	Rank*	FY15-19 Avg	FY18	FY19
ATL	6	1,090	1,077	990
BOS	18	410	410	498
BWI	25	343	376	376
CLT	8	775	736	904
DCA	15	503	568	536
DEN	4	977	1,048	1,103
DFW	1	1,548	1,368	1,652
DTW	24	329	317	387
EWR	3	770	797	1,122
FLL	14	511	546	538
HNL	30	58	121	103
IAD	19	429	354	497
IAH	7	963	745	937
JFK	10	584	737	594
LAS	23	511	553	430

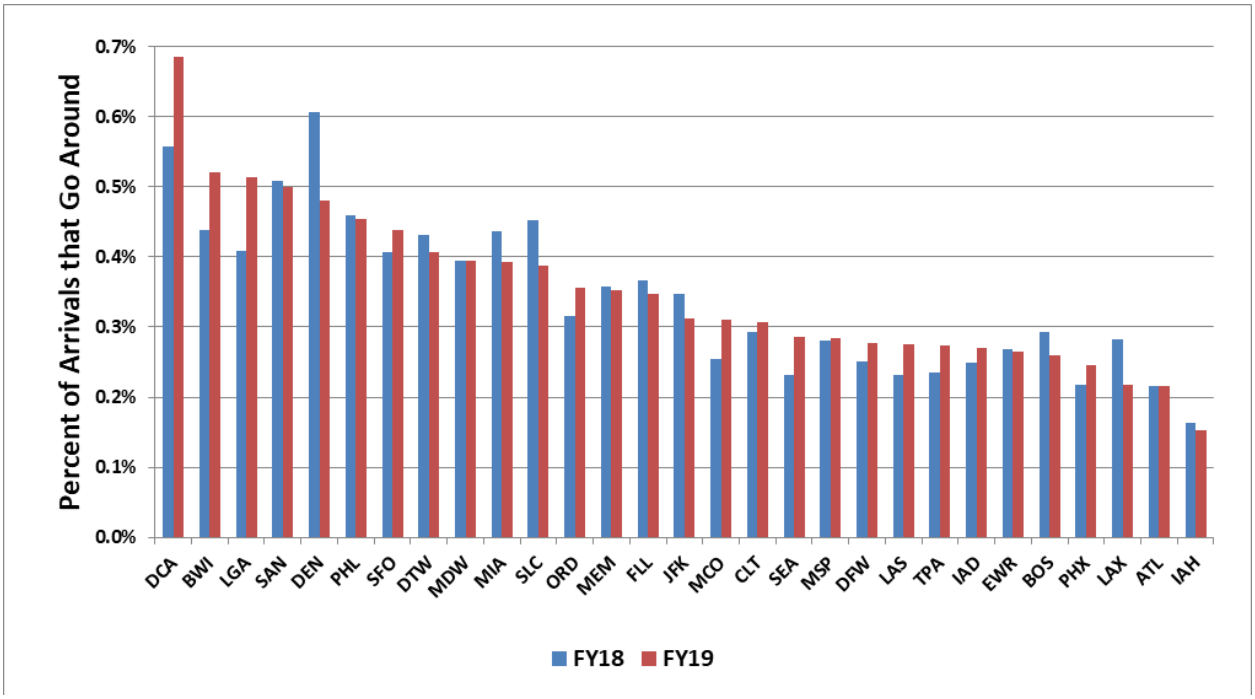
Airport	Rank*	FY15-19 Avg	FY18	FY19
LAX	22	460	421	431
LGA	5	874	683	1,043
MCO	13	537	652	563
MDW	11	601	535	572
MEM	12	690	629	570
MIA	9	676	543	725
MSP	17	460	570	505
ORD	2	1,258	1,435	1,480
PHL	21	448	461	446
PHX	20	519	550	475
SAN	29	298	332	261
SEA	16	337	357	531
SFO	27	342	325	321
SLC	27	364	428	321
TPA	26	346	336	358

*Ranked by number of FY2019 diversions.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), December 19, 2019.

Go-Arounds at Core 30 Airports

FY2018 and FY2019 go-arounds as a percent of arrivals at each Core 30 airport (except Honolulu) appear below. In FY2019, go-arounds at each Core 30 airport did not exceed 0.7 percent; average go-arounds across all Core 30 airports were 0.3 percent. For each year, from FY2015 to FY2019, go-arounds averaged 0.3 percent. (These estimates are based from ASPM and CountOps data.) (*See*, the Appendix for explanations of the Core 30 airport codes.)



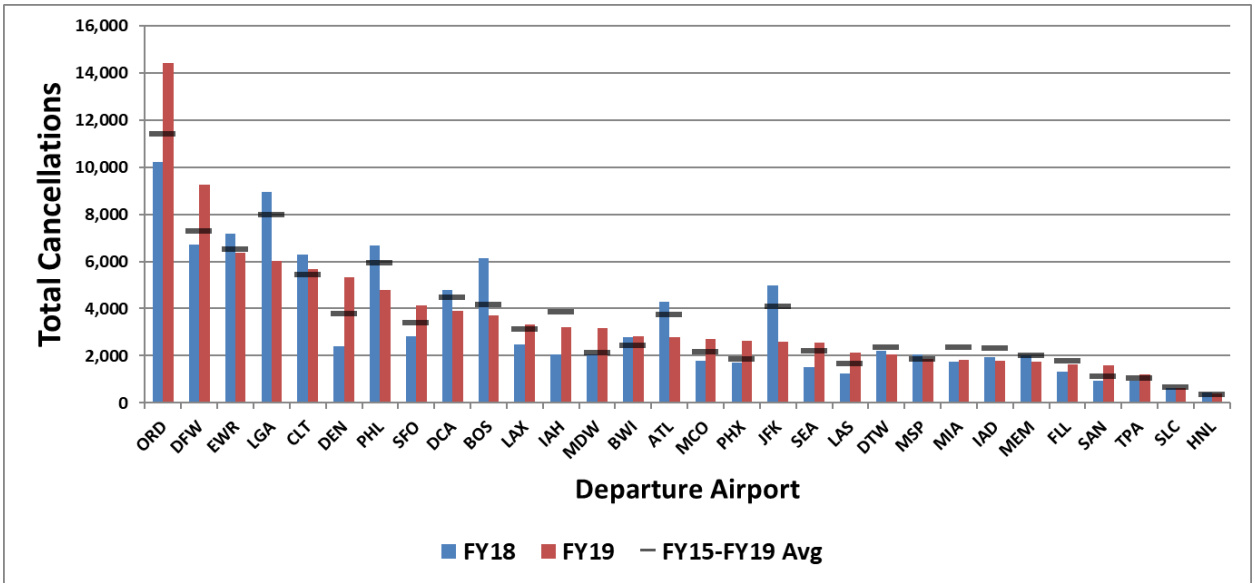
Airport	FY15-19 Avg	FY18	FY19
ATL	0.2%	0.2%	0.2%
BOS	0.3%	0.3%	0.3%
BWI	0.4%	0.4%	0.5%
CLT	0.3%	0.3%	0.3%
DCA	0.6%	0.6%	0.7%
DEN	0.5%	0.6%	0.5%
DFW	0.2%	0.3%	0.3%
DTW	0.4%	0.4%	0.4%
EWR	0.3%	0.3%	0.3%
FLL	0.3%	0.4%	0.3%
IAD	0.2%	0.2%	0.3%
IAH	0.2%	0.2%	0.2%
JFK	0.4%	0.3%	0.3%
LAS	0.3%	0.2%	0.3%
LAX	0.2%	0.3%	0.2%

Airport	FY15-19 Avg	FY18	FY19
LGA	0.5%	0.4%	0.5%
MCO	0.3%	0.3%	0.3%
MDW	0.4%	0.4%	0.4%
MEM	0.4%	0.4%	0.4%
MIA	0.4%	0.4%	0.4%
MSP	0.3%	0.3%	0.3%
ORD	0.3%	0.3%	0.4%
PHL	0.4%	0.5%	0.5%
PHX	0.2%	0.2%	0.2%
SAN	0.6%	0.5%	0.5%
SEA	0.2%	0.2%	0.3%
SFO	0.4%	0.4%	0.4%
SLC	0.4%	0.5%	0.4%
TPA	0.2%	0.2%	0.3%

Sources: Go-arounds: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), January 6, 2020; Arrivals: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), CountOps, January 6, 2020.

Cancellations at Core 30 Airports

Flight cancellation data come from ASPM. In FY2019, flight departure cancellations at Core 30 airports increased by 4.9 percent. As stated previously, cancellations may be due to weather, system delays, equipment issues, or other reasons. The graph and table below show flight cancellations at Core 30 airports for FY2018 and FY2019. In FY2019, the airports with the highest number of cancellations were Chicago O'Hare (ORD), Dallas-Fort Worth (DFW), Newark (EWR), and LaGuardia (LGA). Each had over 6,000 cancellations and together accounted for over 33 percent of Core 30 airport cancellations. (*See*, the Appendix for explanations of the Core 30 airport codes.)



Core 30 Total Cancellations			
FY15-19 Avg	FY18	FY19	%Change
103,617	101,303	106,248	4.9%

Airport	FY15-19 Avg	FY18	FY19
ATL	3,738	4,305	2,799
BOS	4,166	6,150	3,709
BWI	2,428	2,802	2,822
CLT	5,434	6,301	5,662
DCA	4,477	4,780	3,904
DEN	3,797	2,397	5,327
DFW	7,295	6,711	9,247
DTW	2,356	2,221	2,071
EWR	6,523	7,163	6,356
FLL	1,797	1,312	1,620
HNL	382	432	396
IAD	2,325	1,946	1,789
IAH	3,872	2,060	3,218
JFK	4,077	4,997	2,600
LAS	1,664	1,239	2,123

Airport	FY15-19 Avg	FY18	FY19
LAX	3,144	2,465	3,330
LGA	7,966	8,931	6,034
MCO	2,157	1,773	2,695
MDW	2,115	2,064	3,158
MEM	2,002	2,031	1,751
MIA	2,351	1,747	1,806
MSP	1,857	2,056	1,871
ORD	11,426	10,220	14,405
PHL	5,933	6,667	4,800
PHX	1,870	1,710	2,617
SAN	1,144	928	1,578
SEA	2,208	1,526	2,561
SFO	3,386	2,810	4,144
SLC	680	622	647
TPA	1,050	937	1,208

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), February 10, 2020.

Section 4. Traffic Management Initiatives

Traffic Management Initiatives (TMIs) are programs and tools that ATC may use to manage air traffic. These initiatives can take a number of forms, depending on the need and situation. Some TMIs are used to manage excess demand or a lowered acceptance rate at a particular airport. Other TMIs are used to manage traffic issues in the en route environment usually caused by convective weather. The TMIs reported in this report include:

Ground Delay Programs (GDP)

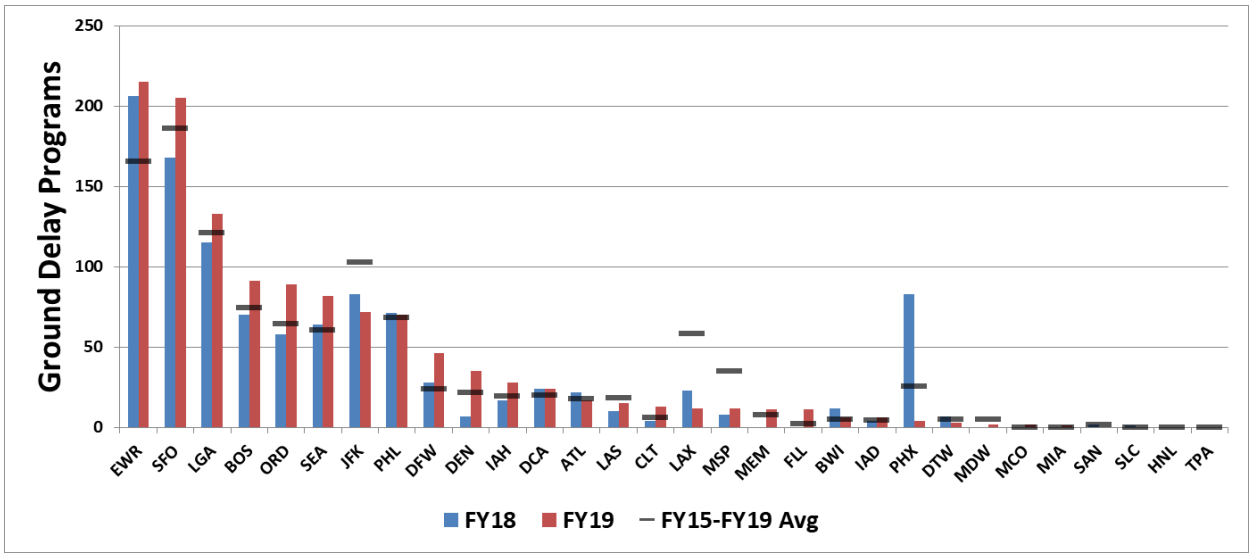
Ground stops (GS)

Airspace Flow Programs (AFP)

Holdings

Ground Delay Programs at Core 30 Airports

A ground delay program (GDP) is a TMI where aircraft are delayed at their departure airport in order to reconcile demand with capacity at their arrival airport. They are airport-specific, therefore, each GDP is reported for a particular airport. In FY2019, OPSNET data shows Newark (EWR), San Francisco (SFO), and LaGuardia (LGA) had the highest number of GDPs. Together, these three airports accounted for 46 percent of GDPs at Core 30 airports. During FY2019, GDPs increased by 10.9 percent across all Core 30 airports, from 1,087 to 1,205. (*See*, the Appendix for explanations of the Core 30 airport codes.)



Total Core 30 GDPs			
FY15-19 Avg	FY18	FY19	%Change
1,074	1,087	1,205	10.9%

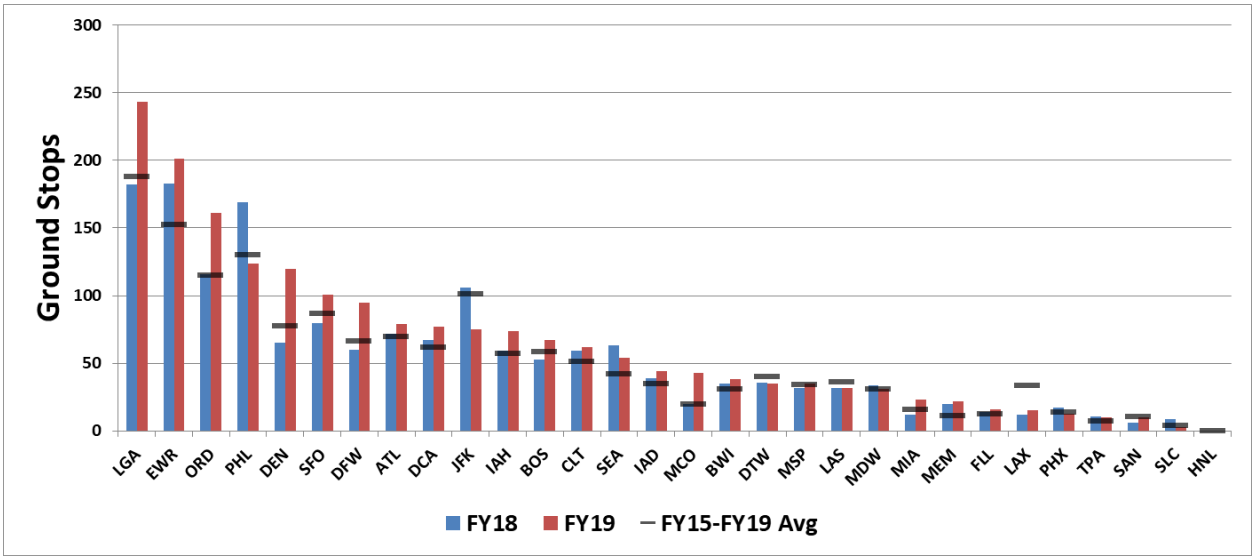
Airport	FY15-19 Avg	FY18	FY19
ATL	18	22	17
BOS	75	70	91
BWI	5	12	6
CLT	6	4	13
DCA	20	24	24
DEN	22	7	35
DFW	24	28	46
DTW	5	7	3
EWR	166	206	215
FLL	3	0	11
HNL	0	0	0
IAD	4	4	6
IAH	19	17	28
JFK	103	83	72
LAS	18	10	15

Airport	FY15-19 Avg	FY18	FY19
LAX	58	23	12
LGA	121	115	133
MCO	0	0	2
MDW	5	0	2
MEM	8	0	11
MIA	0	0	1
MSP	35	8	12
ORD	65	58	89
PHL	68	71	70
PHX	26	83	4
SAN	2	2	0
SEA	61	64	82
SFO	186	168	205
SLC	0	1	0
TPA	0	0	0

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), July 6, 2020.

Ground Stops at Core 30 Airports

Ground stops are the most restrictive form of TMI because they hold all aircraft, within the scope of the ground stop, at their departure airports until conditions at the destination airport allow for their arrival. Ground stops only affect arrivals to a specific airport (not departures) and, like GDPs, are airport-specific. According to OPSNET data, in FY2019, Core 30 airports with the highest number of ground stops were LaGuardia (LGA), Newark (EWR), and Chicago (ORD). Ground stops increased by 14.4 percent across all Core 30 airports, from 1,686 to 1,903. (*See*, the Appendix for explanations of the Core 30 airport codes.)



Total Core 30 Ground Stops			
FY15-19 Avg	FY18	FY19	%Change
1,568	1,663	1,903	14.4%

Airport	FY15-19 Avg	FY18	FY19
ATL	70	72	79
BOS	59	53	67
BWI	31	35	38
CLT	51	59	62
DCA	62	67	77
DEN	78	65	120
DFW	67	60	95
DTW	41	36	35
EWR	152	183	201
FLL	13	14	16
HNL	0	0	0
IAD	35	39	44
IAH	58	59	74
JFK	102	106	75
LAS	36	32	32

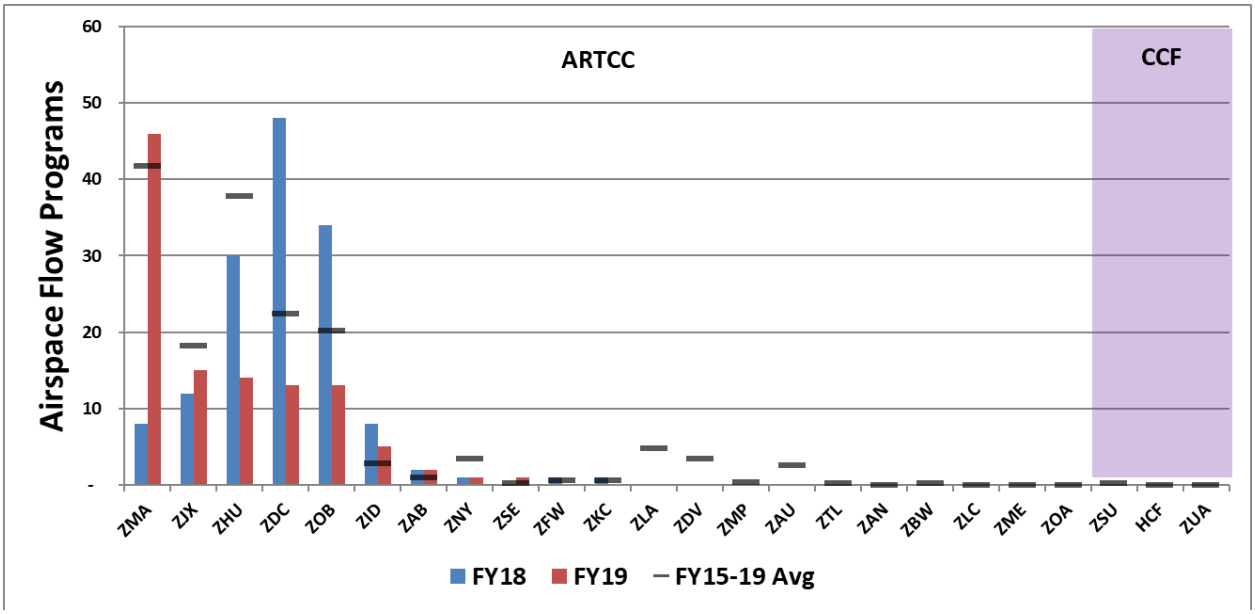
Airport	FY15-19 Avg	FY18	FY19
LAX	34	12	15
LGA	188	182	243
MCO	20	20	43
MDW	31	34	31
MEM	12	20	22
MIA	16	12	23
MSP	35	32	35
ORD	115	116	161
PHL	130	169	124
PHX	14	17	13
SAN	11	6	10
SEA	42	63	54
SFO	87	80	101
SLC	4	9	3
TPA	7	11	10

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), July 7, 2020.

Airspace Flow Programs by Center

Imagine a line drawn in space in association with a constraint, usually convective weather. Under an airspace flow program, any flights filed that crosses the line (usually only in one direction) are assigned an expected departure clearance time (EDCT), to ensure that it arrives at the line, or "boundary," at a time when it can be accommodated. In FY2019, there were 110 airspace flow programs (AFP) imposed by air traffic managers versus 145 in FY2018, a decrease of 24.1 percent. Over the five years from FY2015 to FY2019, the number of AFPs averaged 161 per year.

The graph and table below show airspace flow programs by ARTCC for FY2018 and FY2019. In FY2019, AFPs mainly affected Miami (ZMA), Jacksonville (ZJX), Houston (ZHU), DC (ZDC), and Cleveland (ZOB). These estimates are based on National Traffic Management Log (NTML) data. (*See*, the Appendix for explanations of the ARTCC and CCF codes.)



* Data for CCF JCF are not available.

Total Centers Air Flow Programs			
FY15-19 Avg	FY18	FY19	%Change
161	145	110	-24.1%

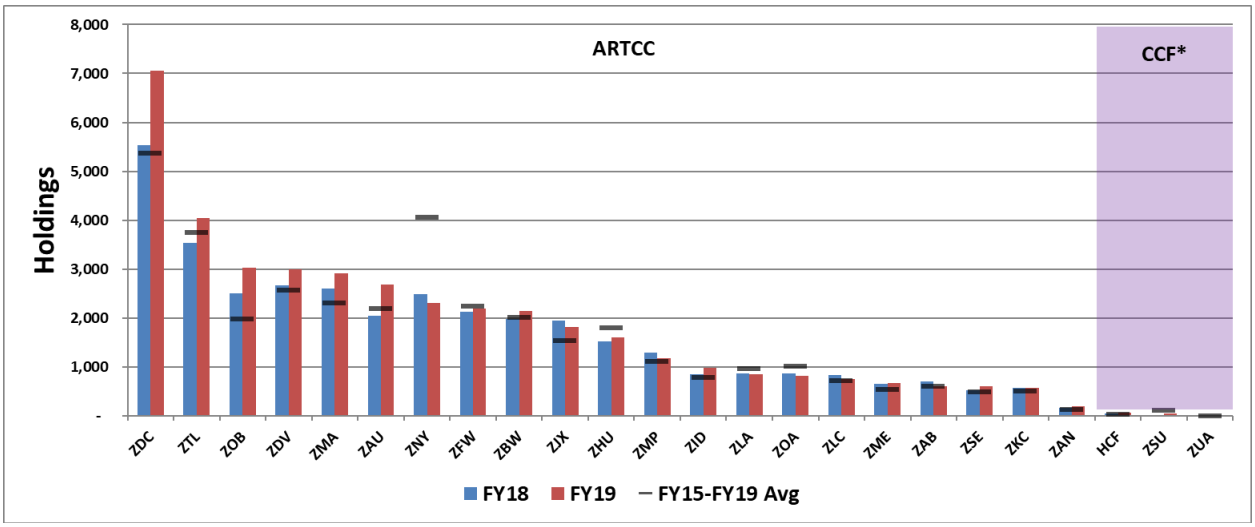
Center	FY15-19 Avg	FY18	FY19
HCF	0	0	0
ZAB	1	2	2
ZAN	0	0	0
ZAU	3	0	0
ZBW	0	0	0
ZDC	22	48	13
ZDV	3	0	0
ZFW	1	1	0
ZHU	38	30	14
ZID	3	8	5
ZJX	18	12	15
ZKC	1	1	0

Center	FY15-19 Avg	FY18	FY19
ZLA	5	0	0
ZLC	0	0	0
ZMA	42	8	46
ZME	0	0	0
ZMP	0	0	0
ZNY	3	1	1
ZOA	0	0	0
ZOB	20	34	13
ZSE	0	0	1
ZSU	0	0	0
ZTL	0	0	0
ZUA	0	0	0

Source: Federal Aviation Administration, Air Traffic Organization, Technical Operations (AJW), National Traffic Management Log (NTML), January 23, 2020.

Holdings by Center

A holding occurs when an aircraft is deliberately delayed en route by flying in a repeating rotational pattern. They are typically implemented when there is traffic congestion or convective weather at the destination airport or an adjacent facility. OPSNET data shows among Air Route Traffic Control Centers (ARTCC), the highest numbers of airborne holdings occur in DC (ZDC), Atlanta (ZTL), Cleveland (ZOB), and Denver (ZDV). (*See*, the graph and table below.) In FY2019, the number of airborne holdings rose by 10.4 percent. (*See*, the Appendix for explanations of the ARTCC and combined control facility (CCF) codes.)



* Data for CCF JCF are not available.

Total Center Flight Holdings			
FY15-19 Avg	FY18	FY19	%Change
36,787	36,317	40,084	10.4%

Center	FY15-19 Avg	FY18	FY19
ZAB	609	697	609
ZAN	125	165	197
ZAU	2,195	2,052	2,686
ZBW	2,016	1,972	2,139
ZDC	5,364	5,533	7,051
ZDV	2,573	2,671	2,987
ZFW	2,242	2,123	2,190
ZHU	1,792	1,524	1,600
ZID	777	855	976
ZJX	1,534	1,944	1,813
ZKC	504	564	576
ZLA	958	870	851

Center	FY15-19 Avg	FY18	FY19
ZLC	719	828	755
ZMA	2,312	2,601	2,920
ZME	542	656	664
ZMP	1,104	1,292	1,174
ZNY	4,060	2,482	2,308
ZOA	1,011	870	817
ZOB	1,986	2,495	3,026
ZSE	482	521	604
ZTL	3,744	3,539	4,044
ZSU	104	15	42
HCF	31	48	55
ZUA	4	0	0

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), January 7, 2020.

Section 5. Safety Metrics

The U.S. national airspace system is the safest air transportation system in the world. This report presents metrics used to measure the safety of the NAS:

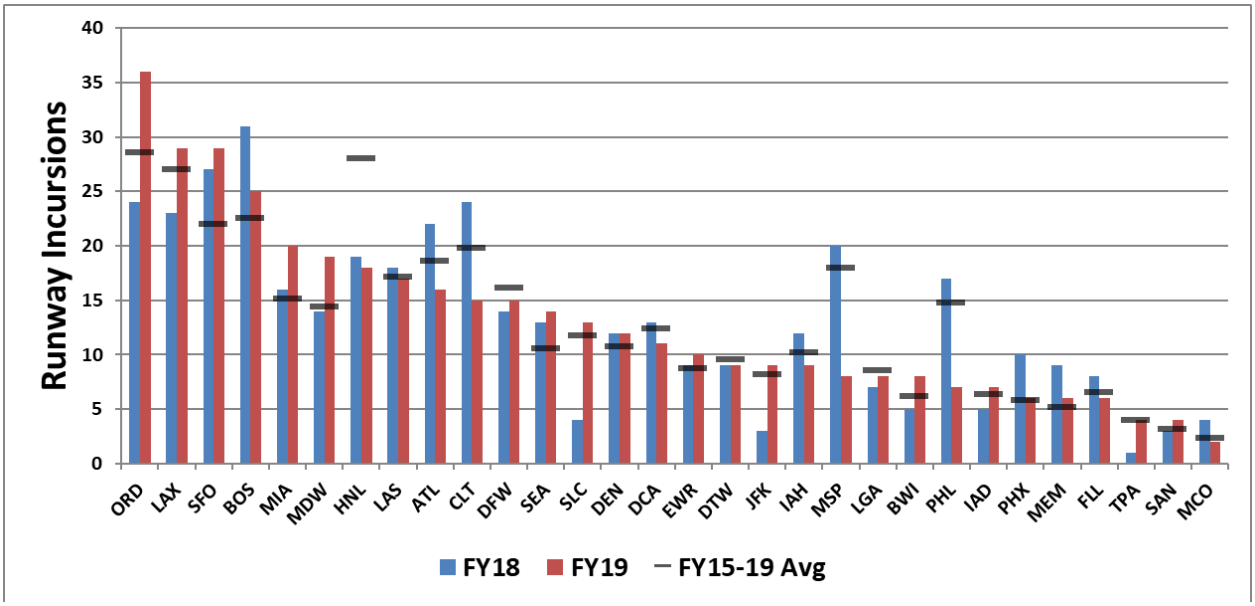
Runway Incursions

Incursions by Type

Loss of Standard Separation Count

Runway Incursions at Core 30 Airports

A runway incursion is any occurrence involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Across all Core 30 airports, the number of runway incursions declined from 396 in FY2018 to 392 in FY2019—a decrease of 1.0 percent. The graph and table below show numbers of runway incursions by airport. Incursions by airport and by type appear on the next page. (*See*, the Appendix for explanations of the Core 30 airport codes.) (This, and the following page, shows runway incursions only. Previous editions *of Air Traffic By the Numbers* included surface incidents as well.)



Core 30 Total Runway Incursions			
FY15-19 Avg	FY18	FY19	%Change
393	396	392	-1.0%

Airport	FY15-19 Avg	FY18	FY19
ATL	19	22	16
BOS	23	31	25
BWI	6	5	8
CLT	20	24	15
DCA	12	13	11
DEN	11	12	12
DFW	16	14	15
DTW	10	9	9
EWR	9	9	10
FLL	7	8	6
HNL	28	19	18
IAD	6	5	7
IAH	10	12	9
JFK	8	3	9
LAS	17	18	17

Airport	FY15-19 Avg	FY18	FY19
LAX	27	23	29
LGA	9	7	8
MCO	2	4	2
MDW	14	14	19
MEM	5	9	6
MIA	15	16	20
MSP	18	20	8
ORD	29	24	36
PHL	15	17	7
PHX	6	10	6
SAN	3	3	4
SEA	11	13	14
SFO	22	27	29
SLC	12	4	13
TPA	4	1	4

*Honolulu is coded as HNL or HCF in the source data.

Source: Federal Aviation Administration, Safety and Technical Training (AJI), January 27, 2020.

Incursions by Type at Core 30 Airports, FY2019

Airport	A	B	C	D	E	Totals
ATL	0	0	7	9	0	16
BOS	0	0	21	4	0	25
BWI	0	0	3	5	0	8
CLT	0	0	8	7	0	15
DCA	0	1	10	0	0	11
DEN	0	0	9	3	0	12
DFW	0	0	8	7	0	15
DTW	0	0	4	4	1	9
EWR	0	0	8	2	0	10
FLL	0	0	6	0	0	6
HNL	0	0	11	7	0	18
IAD	1	0	4	2	0	7
IAH	0	0	5	4	0	9
JFK	0	0	4	5	0	9
LAS	0	0	8	8	1	17
LAX	0	0	18	11	0	29
LGA	0	0	8	0	0	8
MCO	0	0	1	1	0	2
MDW	0	0	10	9	0	19
MEM	0	0	3	3	0	6
MIA	0	1	11	8	0	20
MSP	0	0	6	2	0	8
ORD	0	0	21	15	0	36
PHL	0	0	5	2	0	7
PHX	0	0	5	1	0	6
SAN	0	0	3	1	0	4
SEA	0	0	8	6	0	14
SFO	0	0	19	9	1	29
SLC	0	0	6	7	0	13
TPA	0	0	1	3	0	4

Category A - A serious incident in which a collision was narrowly avoided.

Category B - An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.

Category C - An incident characterized by ample time and/or distance to avoid a collision.

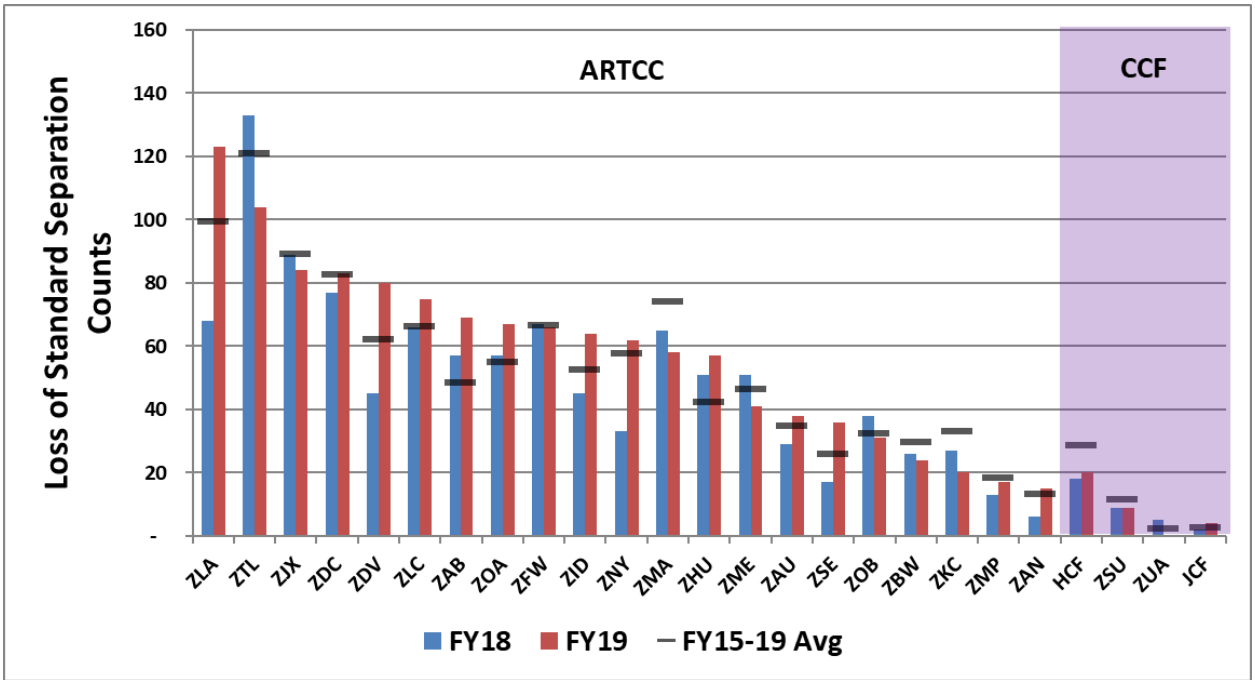
Category D - An incident that meets the definition of a runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft of aircraft but with no immediate safety consequences.

Category E - An incident in which insufficient or conflicting evidence of the event precludes assigning another category.

Source: Federal Aviation Administration, Air Traffic Organization, Safety and Technical Training (AJI), January 27, 2020.

Loss of Standard Separation Count, by Center

Standard separation is a specified separation minima between airborne aircraft in controlled airspace. Breaches of such minima are based on airborne loss event data. Losses of standard separation are reported by Air Route Traffic Control Center (ARTCC) below. Across all centers, losses of standard separation rose 14 percent in FY2019. The three centers with the highest losses of separation were Los Angeles (ZLA), Atlanta (ZTL), and Jacksonville (ZJX). (*See*, the Appendix for explanations of the ARTCC and combined control facilities (CCF).)



Total Losses of Standard Separation			
FY15-19 Avg	FY18	FY19	%Change
1,197	1,094	1,247	14.0%

Center	FY15-19 Avg	FY18	FY19
HCF	29	18	20
JCF	3	2	4
ZAB	48	57	69
ZAN	13	6	15
ZAU	35	29	38
ZBW	30	26	24
ZDC	83	77	83
ZDV	62	45	80
ZFW	67	67	66
ZHU	42	51	57
ZID	53	45	64
ZJX	89	89	84
ZKC	33	27	20

Center	FY15-19 Avg	FY18	FY19
ZLA	100	68	123
ZLC	66	66	75
ZMA	74	65	58
ZME	47	51	41
ZMP	18	13	17
ZNY	58	33	62
ZOA	55	57	67
ZOB	33	38	31
ZSE	26	17	36
ZSU	12	9	9
ZTL	121	133	104
ZUA	2	5	0

Source: Federal Aviation Administration, Air Traffic Organization, Office of Policy and Performance (AJI-3), unpublished Airborne Loss Event data, January 27, 2020.

Section 6. Other ATO Topics

There are a variety of other aspects of the NAS which are of special interest. This report presents the following:

Flight Service Stations

Commercial Space Launch Activity

Flight Service Stations

Flight Service Stations (FSS) are air traffic facilities that communicate directly with pilots to conduct preflight briefings, flight plan processing, inflight advisory services, search and rescue initiation, and assistance to aircraft in emergencies. FSSs also relay air traffic control clearances, process notices to airmen (NOTAMs) and provide updates on aviation meteorological and aeronautical information. All 17 Alaskan flight service stations are Federal facilities and the 6 stations throughout the rest of the country are contracted.

Another service to civil pilots is the direct user access terminal service (DUATS). DUATS is a weather information and flight plan processing service contracted by the FAA. It is a telephone and internet-based system through which pilots can access weather and aeronautical information to help with flight planning.

ALASKA FSS	**Barrow FSS (BRW)** **Cold Bay FSS (CDB)** **Deadhorse FSS (SCC)** **Dillingham FSS (DLG)** **Fairbanks FSS (FAI)** **Homer FSS (HOM)** **Iliamna FSS (ILI)** **Juneau FSS (JNU)** **Kenai FSS (ENA)** **Ketchikan FSS (KTN)** **Kotzebue FSS (OTZ)** **McGrath FSS (MCG)** **Nome FSS (OME)** **Northway FSS (ORT)** **Palmer FSS (LBE)** **Sitka FSS (SIT)** **Talkeetna FSS (TKA)**
ARIZONA FSS	**Prescott LM FSS HUB (PRC)**
DISTRICT OF COLUMBIA FSS	**District of Colum. LM FSS HUB**
FLORIDA FSS	**Miami AIFSS**
MINNESOTA FSS	**Princeton AFSS**
NORTH CAROLINA FSS	**Raleigh-Durham AFSS**
TEXAS FSS	**Fort Worth LM FSS HUB**

FAA Flight Services

FAA Facilities – Alaska Flight Service							
Year	Pilot Briefs	Flight Plans Filed	Preflight Calls	Aircraft Contacts	Airport Advisories	NOTAMs Issued	Total SAR
FY 2015	104,535	199,663	62,847	476,336	296,363	175,165	4,778
FY 2016	101,510	191,767	56,214	490,342	291,224	131,607	4,653
FY 2017	94,553	194,641	52,504	485,847	305,915	135,226	3,662
FY 2018	89,592	210,626	52,200	521,048	325,140	158,003	4,869
FY 2019	92,070	209,024	52,980	542,550	327,130	166,848	6,924

FAA Facilities – Contracted Services							
Year	Pilot Briefs	Flight Plans Filed	Preflight Calls	Inflight Contacts	Flight Data Calls	NOTAMs Issued	Total SAR
FY 2015	1,029,623	719,349	1,727,671	391,632	219,659	251,610	No Data
FY 2016	892,170	608,761	1,495,599	326,820	194,712	227,576	3,782*
FY 2017	829,909	515,868	1,344,640	314,363	175,203	216,997	8,145
FY 2018	797,746	462,207	1,255,510	286,392	178,110	216,249	9,337
FY 2019	747,731	387,694	1,158,005	257,701	166,546	200,192	9,728

* Data delivered starting May 2016.

DUATS – Web Services		
Year	Pilot Briefs*	Flight Plans Filed
FY 2015	13,117,576	3,130,797
FY 2016	17,705,259	3,002,163
FY 2017	29,079,619	2,592,214
FY 2018	26,349,042	2,229,961
FY 2019	18,946,978	1,690,246

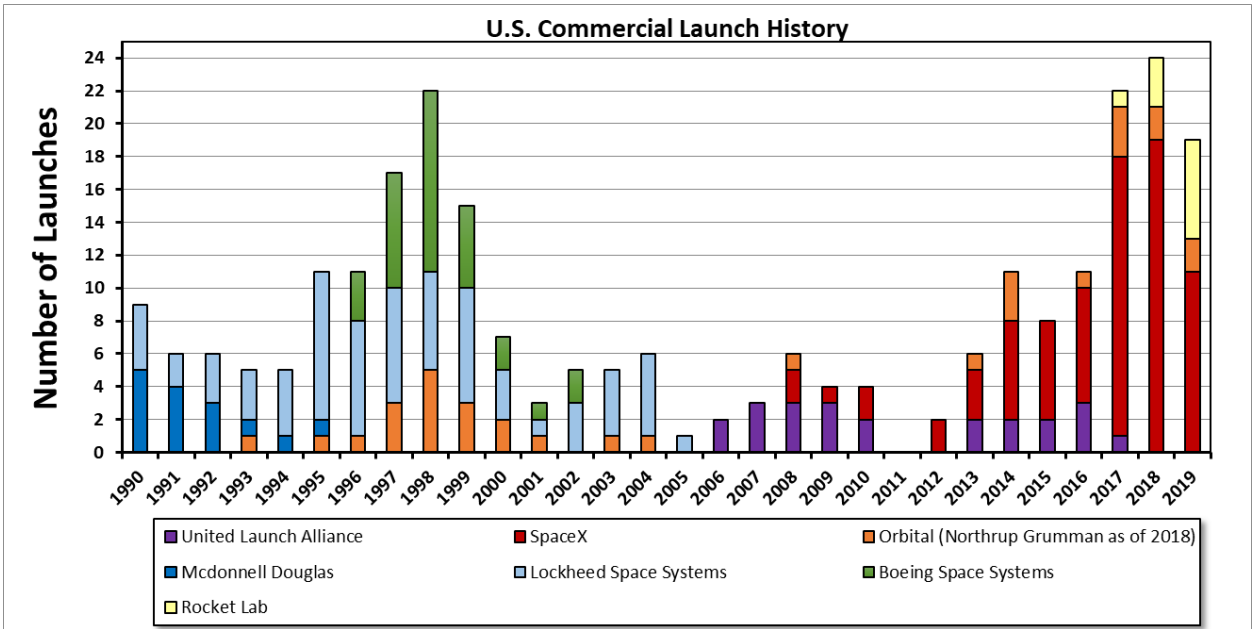
* Number represents the number of hits to DUATs Web Sites/Portals.

United States NOTAM Office (USNOF)		
Year	Domestic	International
FY 2015	1,216,089	561,972
FY 2016	1,327,858	603,930
FY 2017	1,455,238	760,015
FY 2018	1,569,386	874,091
FY 2019	1,670,499	969,951

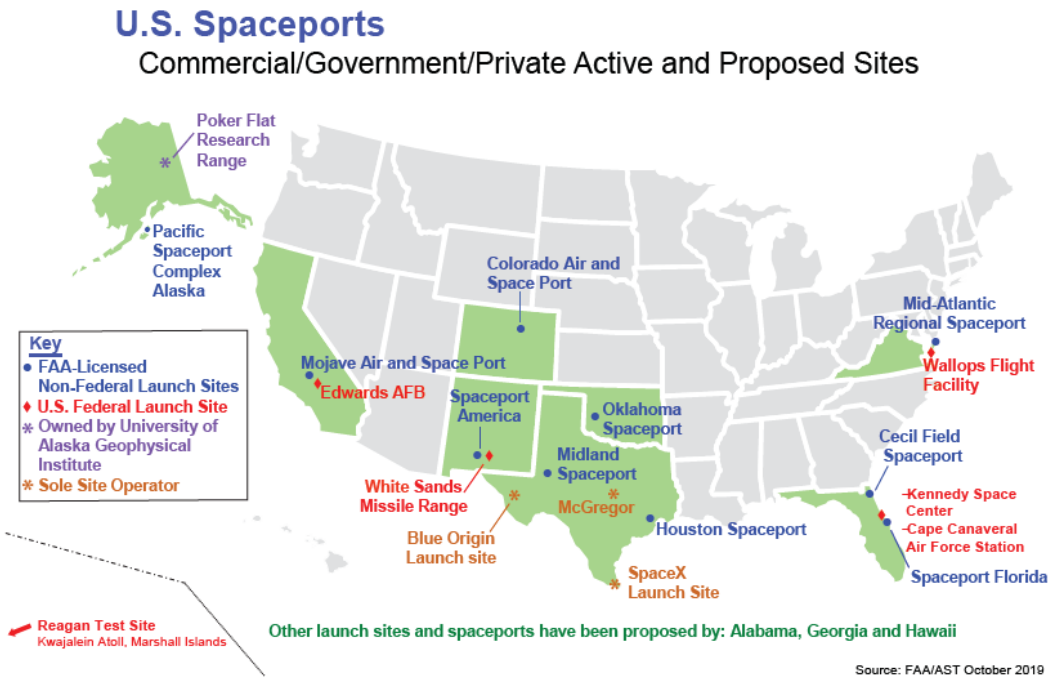
Source: Federal Aviation Administration, Air Traffic Organization, Flight Service (AJR-B), Email communication, November 13, 2019.

Commercial Space Launch Activity

In CY2019, 19 U.S. orbital commercial space launches licensed by FAA took place. Among these 2019 launches, 11 were undertaken by SpaceX, 6 by Rocket Lab, and 2 by Orbital (part of Northrup Grumman Innovation Systems as of 2018). (The 6 Rocket Lab launches took place in New Zealand, not in the U.S. In last year's Air Traffic By the Numbers, Rocket Lab was not included in the launch total.)



Sources: Federal Aviation Administration, Commercial Space Transportation (AST), The Annual Compendium of Commercial Space Transportation, various years; FAA, Commercial Space Transportation (AST), Launches, as of January 22, 2020. https://www.faa.gov/data_research/ commercial_space_data/launches/?type=license; U.S. Dept. of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 1-39, January 17, 2019. https://www.bts.gov/browse-statistical-products-and-data/national-transportation-statistics/national-transportation-8



Source: Federal Aviation Administration, Commercial Space Transportation (AST), October 2019. https://www.faa.gov/about/office_org/headquarters_offices/ast/industry/media/Spaceport_Map_Oct_2019.pdf

Appendix. Facility Codes

Core 30 Airports

Code	Airport	Code	Airport
ATL	Hartsfield-Jackson Atlanta International	LAX	Los Angeles International
BOS	Boston Logan International	LGA	New York LaGuardia
BWI	Baltimore/Washington International	MCO	Orlando International
CLT	Charlotte Douglas International	MDW	Chicago Midway
DCA	Ronald Reagan Washington National	MEM	Memphis International
DEN	Denver International	MIA	Miami International
DFW	Dallas-Fort Worth International	MSP	Minneapolis/St. Paul International
DTW	Detroit Metropolitan Wayne County	ORD	Chicago O`Hare International
EWR	Newark Liberty International	PHL	Philadelphia International
FLL	Fort Lauderdale/Hollywood International	PHX	Phoenix Sky Harbor International
HNL	Honolulu International	SAN	San Diego International
IAD	Washington Dulles International	SEA	Seattle/Tacoma International
IAH	George Bush Houston Intercontinental	SFO	San Francisco International
JFK	New York John F. Kennedy International	SLC	Salt Lake City International
LAS	Las Vegas McCarran International	TPA	Tampa International

Stand-Alone Terminal Radar Control (TRACON) Facilities

LocID	TRACON	LocID	TRACON
A11	Anchorage TRACON	NCT	Northern California TRACON
A80	Atlanta TRACON	P31	Pensacola TRACON
A90	Boston TRACON	P50	Phoenix TRACON
C90	Chicago TRACON	P80	Portland TRACON
D01	Denver TRACON	PCT	Potomac TRACON
D10	Dallas-Fort Worth TRACON	R90	Omaha TRACON
D21	Detroit TRACON	S46	Seattle TRACON
F11	Central Florida TRACON	S56	Salt Lake City TRACON
I90	Houston TRACON	SCT	Southern California TRACON
L30	Las Vegas TRACON	T75	St Louis TRACON
M03	Memphis TRACON	U90	Tucson TRACON
M98	Minneapolis TRACON	Y90	Yankee TRACON
N90	New York TRACON		

Air Route Traffic Control Centers (ARTCC) and Combined Control Facilities (CCF)

LocID	Center	LocID	Center
HCF	Honolulu Control Facility	ZLA	Los Angeles CA ARTCC
JCF	Joshua Tree Control Facility	ZLC	Salt Lake City UT ARTCC
ZAB	Albuquerque NM ARTCC	ZMA	Miami FL ARTCC
ZAN	Anchorage AK ARTCC	ZME	Memphis TN ARTCC
ZAU	Chicago IL ARTCC	ZMP	Minneapolis MN ARTCC
ZBW	Nashua NH ARTCC (Boston)	ZNY	New York NY ARTCC
ZDC	Leesburg VA ARTCC (DC)	ZOA	Oakland CA ARTCC
ZDV	Denver CO ARTCC	ZOB	Cleveland OH ARTCC
ZFW	Fort Worth TX ARTCC	ZSE	Seattle WA ARTCC
ZHU	Houston TX ARTCC	ZSU	San Juan PR Control Facility
ZID	Indianapolis IN ARTCC	ZTL	Atlanta GA ARTCC
ZJX	Jacksonville FL ARTCC	ZUA	Guam Control Facility
ZKC	Kansas City KS ARTCC		

Glossary of Terms

AAR	*See*, Airport Arrival Rate (AAR).
ADC	*See*, Average Daily Capacity (ADC).
ADR	*See*, Airport Departure Rate (ADR).
AFP	*See*, Airspace Flow Programs (AFP).
Airport Arrival Rate (AAR)	The number of arriving aircraft which an airport or airspace can accept from an ARTCC per hour.
Airport Departure Rate (ADR)	The number of aircraft that can depart an airport and the airspace can accept per hour.
Airport Operations	*See*, Operations.
Airspace Flow Programs (AFP)	Airspace flow programs (AFPs) manage demand-capacity imbalances through the issuance of estimated departure clearance times (EDCT) to flights traversing a flow constrained area (FCA). An AFP might be used, for example, to reduce the rate of flights through a center when that center has reduced en route capacity due to severe weather, replacing mile-in-trail (MIT) restrictions for a required reroute, managing airport arrival fix demand or controlling multiple airports within a terminal area.
Air Route Traffic Control Center (ARTCC)	A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. Also known as en route or centers, there are 21 ARTCCs in the continental U.S. A list of the 21 ARTCCs appears in the Appendix.
Air Traffic Control (ATC)	A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.
Air Traffic Control Tower (ATCT)	A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace area regardless of flight plan or weather conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar).
Army Radar Approach Control (ARAC).	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Army airports. Currently, the U.S. does not operate any ARACs.
ASM	*See*, Available Seat Miles (ASM).
ASPM	*See*, Aviation System Performance Metrics (ASPM).
ATC	*See*, Air Traffic Control.
ATCT	*See*, Air Traffic Control Tower.
Available Seat Miles (ASM)	The aircraft miles flown in each inter-airport segment, multiplied by the number of seats available for fare paying passenger use on that segment. Available seat miles are computed by summation of the products of the number of miles on each interairport segment, multiplied by the number of available seats on that segment.
Average Daily Capacity (ADC)	Average daily capacity is calculated as the sum of the airport departure rates (ADR) and the capacity airport arrival rates (AAR), divided by the number of days in the period under consideration.
Average Hourly Capacity (Called Rate)	*See*, Called Rate.

Aviation System Performance Metrics (ASPM)	Aviation system performance metrics (ASPM) data includes flights to and from the ASPM airports (including the Core 30 and OEP 35 airports) and all flights by ASPM carriers, including flights by those carriers to international and domestic non-ASPM airports. All IFR and some VFR flights are included. View this data on the OPSNET website. ASPM flight records fall into two groupings: (1) Efficiency flights are intended to capture all traffic handled by controllers at the ASPM airports and include flights with complete records and flights for which accurate estimates are possible due to only a few pieces of missing data; and, (2) ASPM flights exclude general aviation and military traffic, as well as local (non-itinerant) traffic and records for international flights missing data on the non-U.S. portion of the flight. ASPM contains key event times including actual, scheduled as well as the airline reported gate and runway times. It also synthesizes key times from the traffic flow management system (TFMS) and flight level information from the national traffic management log (NTML).
Called Rate	The hourly throughput that an airport's runways are able to sustain during periods of high demand. Called rates include all arrival and departure traffic that an airport can support. The called rate, or average hourly capacity, is the sum of the average arrival rate (AAR) and the average departure rate (ADR).
Cancellations	The set of cancelled departures as determined by a combination of scheduled flights not flown and TFMS flight plans that were cancelled and not re-filed for ASPM carriers and all other carriers reporting schedule data; and ASQP flight cancellations.
CCF	*See*, Combined Control Facility (CCF).
Center	Also known as air route traffic control center (ARTCC) or en Route. *See*, Air Route Traffic Control Center (ARTCC).
Center Operations	*See*, Operations.
CERAP	*See*, Combined En Route Radar Approach Control (CERAP).
Class B Airspaces	Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace.
Combined ATCT TRACONs	*See*, Terminal Radar Control Facility (TRACON).
Combined Control Facility (CCF)	An air traffic control facility that provides approach control services for one or more airports as well as en route air traffic control (center control) for a large area of airspace. Some may provide tower services along with approach control and en route services. The U.S. has four CCFs. A list of the 4 CCFs appears in the Appendix.
Combined En Route Radar Approach Control (CERAP)	An air traffic control facility that combines the functions of an ARTCC with a TRACON facility.
Core 30 Airports	The 30 airports with the highest number of operations. A list of the Core 30 Airports appears in the Appendix.
Delays	*See*, OPSNET Delays.
Diversions	Gate return/air return and en route diversion are considered a diversion. However, a planned stop for fuel, known before departure from the gate, where the flight has been dispatched to is not.
Direct User Access Terminal Service (DUATS)	DUATS, or direct user access terminal service is a weather information and flight plan processing service contracted by FAA for use by United States civil pilots and other authorized users. The DUAT Service is a telephone- and Internet-based system which allows the pilot to use a personal computer for access to a Federal Aviation Administration (FAA) database to obtain weather and aeronautical information and to file, amend, and cancel domestic IFR and VFR flight plans.
DUATS	*See*, Direct User Access Terminal Service (DUATS).

EDCT	*See*, Expected Departure Clearance Time (EDCT).
Enhanced Traffic Management System (ETMS)	*See*, Traffic Flow Management System (TFMS).
En Route	Also known as Air Route Traffic Control Center (ARTCC) or, simply, Center. *See*, Air Route Traffic Control Center (ARTCC).
En Route Operations	*See*, Operations.
Expected Departure Clearance Time (EDCT)	The runway release time assigned to an aircraft in a traffic management program. *See also*, Ground Delay Programs (GDP).
FCA	*See*, Flow Constrained Area (FCA).
Flight	The period from the start of the takeoff roll to the first landing.
Flight Service Station (FSS)	A flight service station (FSS) is an air traffic facility that provides information and services to aircraft pilots before, during, and after flights, but unlike air traffic control (ATC), is not responsible for giving instructions or clearances or providing separation.
Flow Constrained Area (FCA)	A defined region of airspace, a time interval, or other characteristic used to identify flights subject to a constraint. This constraint may be due to convective weather, military exercises, or other reasons.
FSS	See, Flight Service Station (FSS).
GDP	*See*, Ground Delay Programs (GDP).
Go Around	A go around (sometimes called overshoot) is an aborted landing of an aircraft that is on final approach.
Ground Delay Programs (GDP)	Ground delay programs are implemented to control air traffic volume to airports where the projected traffic demand is expected to exceed the airport's acceptance rate for a lengthy period of time. Lengthy periods of demand exceeding acceptance rate are normally a result of the airport's acceptance rate being reduced for some reason. The most common reason for a reduction in acceptance rate is adverse weather such as low ceilings and visibility. How it works: Flights that are destined to the affected airport are issued expected departure clearance times (EDCT) at their point of departure. Flights that have been issued EDCTs are not permitted to depart until their expected departure clearance time. These ECDTs are calculated in such a way as to meter the rate that traffic arrives at the affected airport; ensuring that demand is equal to acceptance rate. The length of delays that result from the implementation of a ground delay program depends upon two factors: how much greater than the acceptance rate the original demand was, and for what length of time the original demand was expected to exceed the acceptance rate.
Ground Stops (GS)	Ground stops are implemented for a number of reasons. The most common reasons are: • To control air traffic volume to airports when the projected traffic demand is expected to exceed the airport's acceptance rate for a short period of time. • To temporarily stop traffic allowing for the implementation of a longer-term solution, such as a ground delay program. • The affected airport's acceptance rate has been reduced to zero. How it works: • Flights that are destined to the affected airport are held at their departure point for the duration of the ground stop.
Holdings	Holding (or flying a hold) is a maneuver designed to delay an aircraft already in flight while keeping it within a specified airspace.
IFR Flights	Instrument Flight Rules. A set of rules governing the conduct of flight under instrument meteorological conditions.

Level-Offs	Level-offs are tracked from the top-of-descent (TOD) point or 200 nautical miles (NM) from the airport, whichever is closer. A trajectory segment is considered as a level-off if the change in altitude of position reports is less than or equal to 200 feet and the segment is at least 50 seconds in duration. The metric is calculated as the sum of the count of level-offs for each flight within a scope (i.e. non-military instrument flight rules (IFR) operations arriving into Core 30 airports), divided by the total number of flights within the scope. The metric is derived from flight position reports from the National Offload Program (NOP).
Load Factor	The summation of the number of revenue passenger miles (RPM), divided by the summation of the number of available seat miles (ASM), on revenue paying commercial flights. This quotient is expressed as a percentage. *See also*, available seat miles (ASM) and revenue passenger miles (RPM).
Loss of Separation Events	A defined loss of separation between airborne aircraft occurs whenever specified separation minima in controlled airspace are breached. Minimum separation standards for airspace are specified by air traffic service (ATS) authorities, based on International Civil Aviation Organization (ICAO) standards.
Miles-in-Trail (MIT)	A specified distance between aircraft, normally, in the same stratum associated with the same destination or route of flight.
National Airspace System (NAS)	The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. This includes system components jointly shared with the military.
Notices to Airmen (NOTAM)	A NOTAM is a notice containing information essential to personnel concerned with flight operations, but not known far enough in advance to be publicized by other means. It states the abnormal status of a component of the national airspace system (NAS) – not the normal status.
Operations	• Airport operations: The number of arrivals and departures from the airport at which the airport traffic control tower is located. • Tower operations: Airport operations, plus airport tower overflights. • TRACON operations: The number of operations passed to and from area airports or centers, including overflights through TRACON airspace. • En route or center operations: The number of operations passing to and from a TRACON to a center, or from one center to another center, or from a center to a TRACON. It includes U.S. overflights and oceanic traffic through center air space that do not arrive at or depart from U.S. territory.
Operational Network (OPSNET)	OPSNET is the official source of national airspace system (NAS) air traffic operations and delay data. This data are used to analyze the performance of the FAA's air traffic control facilities. Reportable delay includes information such as the constrained facility, the reason for delay (weather, equipment, runways, volume, etc.), and the traffic management initiative (TMI) employed in delaying the aircraft.
OPSNET Delays	Delays to instrument flight rules (IFR) traffic of 15 minutes or more, which result from the ATC system detaining an aircraft at the gate, short of the runway, on the runway, on a taxiway, or in a holding configuration anywhere en route, must be reported. The IFR controlling facility must ensure delay reports are received and entered into OPSNET. These OPSNET delays are caused by the application of initiatives by the traffic flow management (TFM) in response to weather conditions, increased traffic volume, runway conditions, equipment outages, and other causes. Below are descriptions of the categories of delay causes resulting in a reportable delay: • Weather: The presence of adverse weather conditions affecting operations. This includes wind, rain, snow/ice, low cloud ceilings, low visibility, and tornado/ hurricane/thunderstorm. • Volume: Delays must only be reported as volume when the airport is in its optimum configuration and no impacting conditions have been reported when the delays were incurred. • Runway/Taxiway: Reductions in facility capacity due to runway/taxiway closure or configuration changes. • Equipment: An equipment failure or outage causing reduced capacity. • Other: All impacting conditions that are not otherwise attributed to weather, equipment, runway/taxiway, or volume, such as airshow, aircraft emergency, bomb threat, external radio frequency interference, military operations, nonradar procedures, etc. Non-reportable delays are delays incurred by IFR traffic, but which should not be reported in OPSNET.

Overflights	• Terminal overflight: A terminal IFR flight that originates outside the TRACON's/RAPCON's/Radar ATCT's area and passes through the area without landing. • En route overflight: An en route IFR flight that originates outside the ARTCC's area and passes through the area without landing.
Radar Approach Control (RAPCON)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Air Force airports. Currently, the U.S. does not operate any RAPCONs.
Radar ATC Facility (RATCF)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Navy airports. Currently, the U.S. does not operate any RATCFs.
RAPCON	*See*, Radar Approach Control (RAPCON).
RATCF	*See*, Radar ATC Facility (RATCF).
Revenue Passenger Miles (RPM)	One revenue passenger (fare paying passenger) transported one mile. Revenue passenger miles are computed by summation of the products of the revenue aircraft miles on each interairport segment, multiplied by the number of revenue passengers carried on that segment.
Runway Incursions	A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.
Stand-Alone TRACON	*See*, Terminal Radar Control Facility (TRACON).
Terminal Radar Control Facility (TRACON)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. A TRACON located in an air traffic control tower is an up down or combined TRACON. A TRACON that does not share a facility is a stand-alone TRACON. The U.S. has 147 civilian TRACONs. There are 122 TRACONs in shared facilities and 25 stand-alone TRACONs. A list of the 25 stand-alone TRACONs appears in the Appendix.
Top-of-Descent (TOD)	Top-of-Descent is the transition from the cruise phase of a flight to the descent phase, the point at which the planned descent to final approach altitude is initiated.
Tower Operations	*See*, Operations.
TRACON	*See*, Terminal Radar Control Facility (TRACON).
TRACON Operations	*See*, Operations.
Traffic Flow Management System (TFMS)	TFMS is a data exchange system for supporting the management and monitoring of national air traffic flow. TFMS processes all available data sources such as flight plan messages, flight plan amendment messages, and departure and arrival messages. TFMS is restricted to the subset of flights that fly under instrument flight rules (IFR) and are captured by the FAA's en-route computers. Formerly known as the enhanced traffic management system (ETMS).
VFR	*See*, Visual Flight Rules (VFR).
VFR flights	Flights operated under visual flight rules.
Visual Flight Rules (VFR)	Visual flight rules are rules that govern the procedures for conducting flights under visual conditions. The term "VFR" is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate a type of flight plan.

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